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Rick Baker Revisited 4

In the seven years since our last examination of Rick Baker and his meteoric career, the still youthful makeup artist has continued to break new ground in his chosen profession. Among the triumphs of the period was his creation of a friendly Sasquatch for *Harry and the Hendersons*, his transformation of Eddie Murphy into an old white man in *Coming to America*, the development of the ultimate gorilla suit for *Gorillas in the Mist* and the concoction of a new batch of mogwais and gremlins for *Gremlins 2*. *Article by Ron Magid.*

Through the Proscenium Arch 30

In the ever-evolving theme park business the latest attractions transport thrill-seekers into outer space, inner body and back in time without ever moving them off a fixed hydraulic platform. By marrying flight simulator technology with motion picture effects footage, ride adventures derived from genre epics such as *Star Wars*, *Innerspace* and *Back to the Future* employ high-tech visuals and sophisticated motion cues to create kinetic sensations of pulse-pounding impact. *Article by Janine Pourroy.*

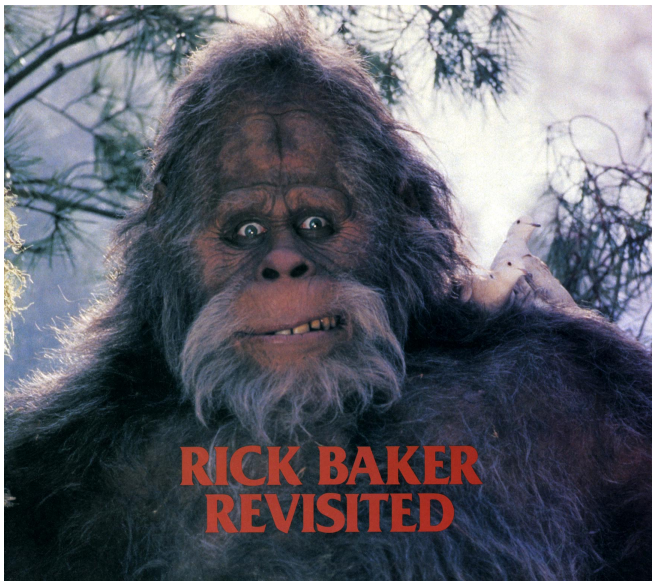
Death and Aging — A Corleone Chronicle 46

Spanning much of the twentieth century, the *Godfather* trilogy called for many of its principal players to age during the course of the narrative. Hired by director Francis Ford Coppola to effect this aging convincingly was makeup master Dick Smith who was involved in all three films. Realistic bloodletting was also essential. To produce the requisite mayhem, Coppola engaged two generations of physical effects men — A.D. Flowers, Sass Bedig, Joseph Lombardi, Lawrence Cavanaugh and R. Bruce Steinheimer. *Article by David Morgan.*

FRONT COVER — A prehistoric encounter in the 'Back to the Future' ride.
A female gremlin with matrimonial designs in *Gremlins 2* — BACK COVER.

RICK BAKER REVISITED

article by
Ron Magid



Once upon a time an impetuous kid obsessed with monsters longed to be a modern day *Frankenstein* — that is, until he learned it was not a mad doctor who created the creatures that haunted his favorite horror movies, but rather a makeup artist wielding clay and rubber. Now, some thirty years later, that impetuous kid has become a legend in the field of special makeup effects. At the time of our 1984 issue chronicling his career to date, Rick Baker, monster maker, had reached the pinnacle of cinematic achievement, garnering the highest honor the entertainment industry can bestow — *an Academy Award for the lycanthropic effects of* An *American Werewolf in London — and it seemed a certainty he would win again for his excellent work in Greystoke*.

It was not to be.

The failure by the Academy of Motion Picture Arts and Sciences to recognize his landmark work on *Greystoke* caused Rick Baker to consider, perhaps for the first time, whether working himself into the ground on every project was still worth it. "I worked probably the hardest I had ever worked on *Greystoke*," Baker admitted, "and I looked it. I looked at myself in the mirror and I thought, 'How many years am I going to stay alive like this?' And I started thinking about my life. I started doing this stuff when I was ten. When I was a kid, I spent most of my time in my bedroom — which was my little lab — making my foam rubber, doing my sculptures and sleeping on a convertible sofa because it took up less room than a bed. I realized I'd been working with all these poisonous chemicals all my life and I felt that there must be something else to life besides playing with clay, chemicals and plaster."

While Baker's career has been filled with great achievements in the seven years between *Greystoke* and his latest effort, *Gremlins 2*, he has also experienced disappointment and a feeling of stagnation. No longer strictly a monster maker, as his talent has matured, so has the artist. After twenty years at the peak of his profession — right alongside his mentor and friend Dick Smith — the thirty-nine-year-old Baker has reached the point where his career no longer presents the challenges it once did.

In the early days, Rick Baker had to fight just to get the limited amount of information available so he could perform his backyard innovations, revolutionizing the field in his bedroom unbeknownst

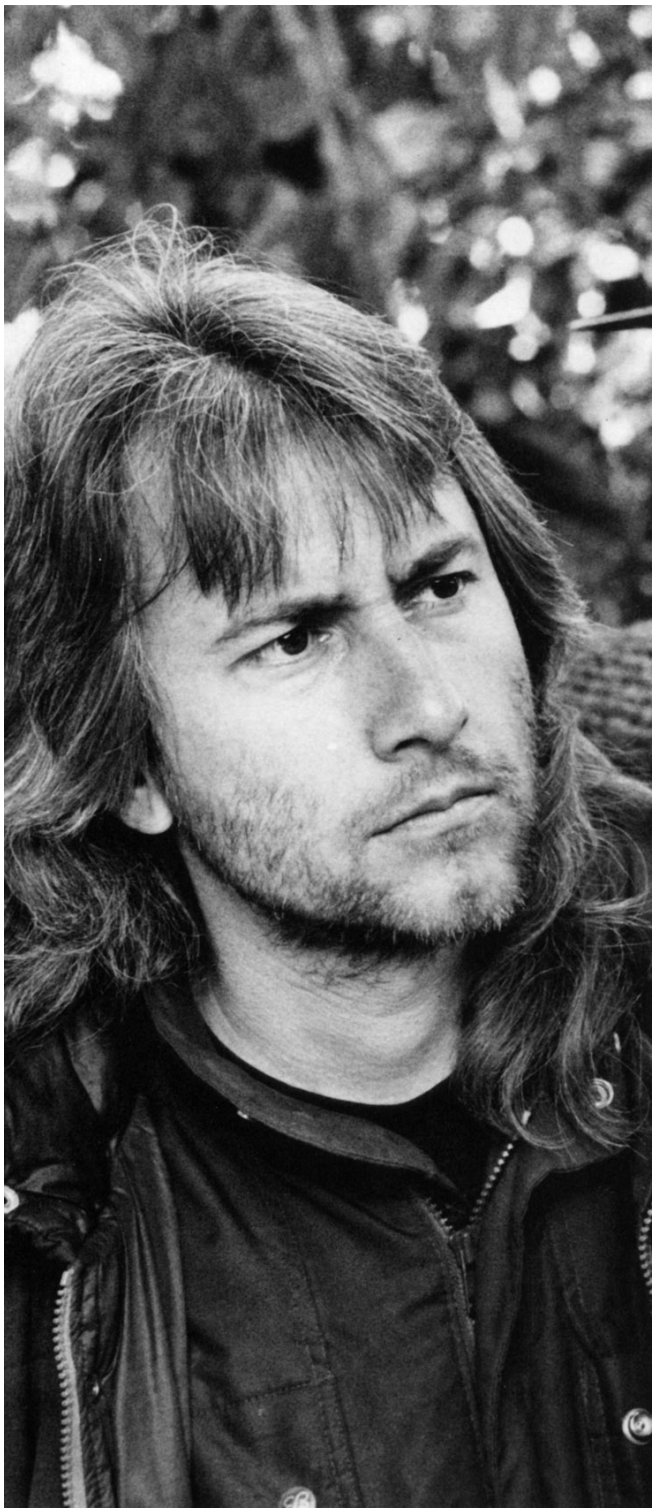
to those who jealously guarded the mysteries of makeup from the inquisitive youth. In those dark ages before *Star Wars*, there were only two men specializing in the sort of cinematic legerdemain Baker was interested in mastering — John Chambers and Dick Smith. "I was a big Chambers fan," said Baker. "I loved *Planet of the Apes* and a lot of his things; and everybody in Hollywood followed the John Chambers school. But after meeting Dick Smith and seeing how Dick did things, I felt he had a better way; so I opted for the Dick Smith school. As a result, I was this kid who had these radical ways of doing things that came from this guy in New York who got all the time in the world to do his makeups. That was the attitude that all the makeup guys out here in Hollywood had."

Nurtured by the master makeup artist from New York, whose techniques differed considerably from those employed by most West Coast practitioners, the young high schooler quickly blossomed into a major talent. He was not exactly welcomed into the club, however — and Baker knew why. "I began to realize that there were a lot of people in the business who were just bullshit artists who could barely scrape by; so when I came along with more ability and was an eighth of their age, they didn't like it. I understand now what those old guys were worried about — because *I'm* the old guy and I see all these young kids coming along with stuff and, goddammit, these guys are good! Fortunately, I'm in a place in my life where I don't feel threatened by good work; but I can definitely understand that fear a lot more now than when I was young."

Indeed. After heading more than a dozen major projects and at least as many minor ones in his twenty-year career, Baker has trained hundreds of makeup artists, many of whom became his own *Frankenstein* monsters — competitors created in his image such as *Rob Bottin*, Tony Gardner and Steve Johnson. "I think I had something to do with putting a lot of people at the top of this field today, as did Dick Smith. I take a lot of pride in that. When Dick tried to find out how things were done from people in Hollywood, they told him to go fuck himself; so he said, 'If somebody asks me, I'm going to tell them how to do it.' And since I idolized Dick and wanted to be just like him, I did the same thing. I was confident in my ability and I knew I could get work, so I was quite happy to help anybody out and tell them how to do things. But I've been burned by that. I've lost jobs to people that I trained who underbid me and used ideas we talked about before I was able to use them. A certain part of me says, 'If I'd been a little more tight-lipped, I could still have the whole business to myself.' But there's more work than I could do, I get paid good money and I stay as busy as I want to be."

Still, after the simultaneous triumph and disappointment of *Greystoke*, Baker was feeling worn out. And to make matters worse, things were fairly stormy on the home front as well. Baker was gearing up to produce the beneficent extraterrestrials of *Cocoon* when his personal and professional life collided head on. "I had just made a deal with Fox to do the film when my wife Elaine decided she wanted a divorce. It was more than I could deal with. I called up the studio and said, 'I can't get into this.' I recommended Greg Cannom for the job and told them I'd look over what he did. So on *Cocoon* I was just a consultant. I had already assembled some of the crew I was going to use, so I let Greg use my people and my shop; but I was hardly involved with the project other than to say, 'Yeah, that looks good!' That was the extent of it. I did some alien designs initially, but Greg came up with his own approach which they used. My designs were actually a little more on the human side — they looked like a cross between an oriental and a bushman with a bigger head. Greg's stuff was not

what I would've done, but it worked fine. We knew all along that the aliens were going to glow, so you wouldn't see much of what was underneath anyway."



With four major film projects and a number of lesser assignments, the past seven years have been productive and rewarding for makeup master Rick Baker. On location in Kenya, Baker oversees the shooting of some lifelike mountain gorillas he created for Gorillas in the Mist.

While Baker was weathering his divorce, Dick Smith came to his rescue with a request that he help out on Jeff Bridges' transformation from alien baby to human adult in *Starman* — a bittersweet cross-species love story directed by John Carpenter. "Dick had worked out what he thought the transformation effect should be," Baker recalled, "and decided it was too much for him to do by himself, so he asked me to do part of it. This was in the dark days of my life when I was going through my divorce. I wasn't that interested in doing it, but I thought, 'Oh well, I'll do one thing.' The transformation started out with this weird baby — which was supposed to be human, but Carpenter didn't want you to know for sure at first — so I decided I would do that part. Then Dick got Stan Winston to do the more adolescent 'change-o' stage, while he himself did the final head transformation. For my part, I sculpted the baby's head and had Tom Hester do the body. We used a real cast of hands and feet that we took off Doug Beswick's kid. The *Starman* baby was actually one of the neatest, most real-in-person things I've ever done. It had a really neat translucent quality because we made it out of hot-melt vinyl. As a result, you could see veins under the skin and we were able to put a light inside it so a glow appeared to travel up his back to his head where his brain seemed to be pulsating as it grew."

In 1984, Baker responded to a call from his mentor, Dick Smith, to assist in the transformation of an alien baby to a human adult for Starman. Baker's portion of the task — shared principally with associate Tom Hester — was to produce a mechanical baby that could roll over and sit up.

For Ratboy, his next assignment, Baker designed the makeup that transformed actress Sharon Baird into an outcast youth with rodentlike features.

Arms and legs on the puppet were fully articulated. "It could roll over. In the film, he starts out on his side, then he rolls over and sits up. One night when I was thinking about how we were going to do it all with one puppet, I built the prototype mechanism myself out of junk that was in my garage — popsicle sticks and clothespins and dowel rods. I worked the problems out using a telescoping tube that ran through the shoulder up to the arm. When you turned the rod, it would flip the puppet over. The tube also contained cables that ran to the elbow, wrist and fingers so you could operate that whole thing as you turned it over. The legs worked basically the same way off two different tubes, one inside the other, that rotated around. When I brought this thing in to show my mechanical guys, they just laughed at it; but I said, 'This is what I want, so just make it right!'"

Once the mechanism was covered with its hot-melt baby skin, Baker had to find a way to paint it that would maintain its translucency. "Almost by accident I found a stain that gave it a really neat translucent quality because it literally soaked inside the vinyl. The first time I painted the baby with it, I did a very subtle paint job; and when I got up to look at it the next morning, it was gone — it

had continued to soak in until it disappeared. So the stain had to be timed. I did some tests and I found that if I painted it really boldly, within two days it looked great and after another day it was gone." Two days before the shoot, Baker carefully painted his weird baby, arranging to bring it to the set when it would be looking its best. "I had something I thought was really neat looking; but the way they ended up lighting and shooting it, you couldn't see any of its neat qualities. We showed up at Warner Brothers to film it during the postproduction period. They were doing inserts of the speedometer of the car and things like that, and nobody seemed to care about whether the baby was lit carefully or shot right. There was a platform set up to shoot it on — scaffolding with some carpet on it — and it was all a big rush. I was very disappointed."

Baker had no aesthetic complaints about his next project, *Ratboy*, a Clint Eastwood production being directed by his then-girlfriend Sondra Locke. The film — a reworking of the *Elephant Man* story — concerned a young boy with ratlike features and the attempts by an eccentric opportunist and her dimwitted brothers to exploit the poor unfortunate. "*Ratboy* was a film that I turned down a couple of times," Baker noted, "until Clint Eastwood called me up and threatened to let me make his day, so I said, 'All right!' I always liked animal-people things, so that part was appealing to me, but I didn't think the script was all that exciting. I did a bunch of different designs and Clint picked one that I thought was a good design but inappropriate for the movie — it was too much of a fantasy character. It had a ratlike face and big rat eyes that were widely spaced. It was a neat look — part mechanical and part makeup — and I think Clint was fooled by the fact that the painting I did of it was better than the one that was more appropriate, but he insisted that was what he wanted. I said: 'Tell you what — I'll make one of these to fit myself this way, and I'll do another the way I think it should be. We'll photograph some tests and you can look at them and I think you'll agree that this other approach is right.' As a result of that, we ended up using the more standard makeup that I had recommended. After I did the makeup on myself, Sondra Locke wanted me to play *Ratboy*, and I said 'Uh-uh!' because I didn't want to wear the makeup for fifty days of shooting. So I said, 'Look, I'm not a big man, but this movie is about *Ratboy* and I think he should be smaller than me.'" Eventually, Locke agreed and actress Sharon Baird — ironically, one of the original Mouseketeers — was hired to play the character.

Baker enjoyed doing the *Ratboy* makeup and working with Locke. "Sondra was very involved with the preproduction — more so than any director I've ever worked with. She was always coming by, looking at things and asking us to make a lot of minor changes — which actually got to be a bit of a headache, but I appreciated that she was into it. We did at least half a dozen variations on the same theme — all very similar — and finally went with the one I had done originally." Baker constructed his makeup around a denture containing two protruding rat teeth that fit on an armature outside the actress' mouth. A toggle switch that she could operate with her tongue was incorporated to make the nose wiggle. "It was a self-contained mechanism that extended behind the rat teeth into the roof of her mouth. The majority of the makeup was in one big piece, but there was also a brow piece and ear appliances. She also had toe appliances on her feet as well as finger appliances and pads on the palms of her hands, but you never really saw them and I thought they added to the makeup time for no reason."

While Baker was wrapping up *Ratboy*, Michael Jackson contacted him about reteaming for a 3-D musical featurette that would do for science fiction what *Thriller* had done for horror — a project

that ultimately came to be known as *Captain Eo*. Executive produced by George Lucas and directed by Francis Ford Coppola, the multimillion-dollar extravaganza would become a major attraction at the Disney theme parks in California and Florida. "Michael wanted me to do all the characters," Baker recalled, "but I was too busy on *Ratboy*, so I told him I could only do one or two of them. I actually designed Anjelica Huston's witch makeup — which Tom and Bari Burman executed — but Anjelica didn't want to wear the facial appliances so they ended up painting her face instead. I also chose to do the Fuzzball character, who was originally supposed to be a round, furry guy. There was another character called Flutter who had butterfly wings, and they decided to combine the two, so we built a little maquette of this flying chipmunk with butterfly wings. I had very little to do with it myself— I gave Tom Hester the project, which I then oversaw and made suggestions on. One of the biggest problems was that we had built our puppets and painted them realistically, and then the cinematographer, Vittorio Storaro, came along and decided that each character was its own color of light — so Fuzzball had to be red! I said, 'But we've already made him and he isn't red and he's got these neat butterfly wings that look really good.' But Storaro was insistent, so we gobbed red paint on Fuzzball's fur and repainted his wings. We made a couple of different hand puppets, which worked fine, but I was disappointed with the shots of him flying away from camera because you could see that a crescent-shaped part of the character was missing where the puppeteer's arm disappeared up his butt — they never matted that in."

It was his next project — the saga of an average American family who adopts a friendly Sasquatch — that would earn Baker his second Academy Award and ensure his superstar status into the nineties. "What attracted me most about *Harry and the Hendersons* was the challenge of creating a character — a giant eight-foot-tall creature — with extremely expressive features. Harry was a character with soul — and that had to show on his face. The script called for him to do a lot of movement in and out of rooms and so on, so I knew there was no way we could operate his face with cables. In order to successfully fulfill the needs of the script, Harry's head would have to be completely self-contained and radio-controlled, which would make it very different from any of the other gorilla heads I had done before. Fortunately, in my early designs I had given Harry a pointed, apelike cranium — which was based on eyewitness sightings of the yeti and Bigfoot — and that design allowed enough room for servos to be placed inside his head."

In 1987, Baker won his second Academy Award for Harry and the Hendersons — a modern-day fable in which an average middle-class family adopts a gentle and soulful Sasquatch they have inadvertently run down on a mountain road. The challenge for Baker was to create a

Kevin Peter Hall — a seven-foot-two actor with the right temperament and body language to bring the character to life — had worked with Baker on an

earlier project that had never come to fruition. When Baker sought him out for the Harry role, he found that Hall was a regular cast member on the television sitcom *Misfits of Science*. Disappointed, Baker selected another actor and began the customary casting and sculpting processes needed to build the character. Later, when *Misfits of Science* was pulled from the air, Baker felt strongly enough about using his first choice that he persuaded the producers to hire Hall on the condition that Baker absorb the cost of starting over.

nonthreatening eight-foot-tall creature with ultra-expressive features.

Though Harry's hair suit was basic, the heads were anything but. Two fully-articulated versions — both radio-controlled and self-contained — were constructed for the majority of Harry's scenes. "We also had a special cable-controlled head that was designed only to smile for the scenes where Harry had to give his big toothy grin. Then there was another head that just had the basic brow and jaw movement. That was operated by Kevin and was used for scenes where Harry was running through the forest. Because Bigfoot is basically humanoid, I decided not to give Harry gorilla-like arm extensions. Instead, his hands were rubber gloves designed to make his fingers longer and more apelike. For the scenes where Harry had to be more dexterous and pick things up, we made gloves with shorter fingers."

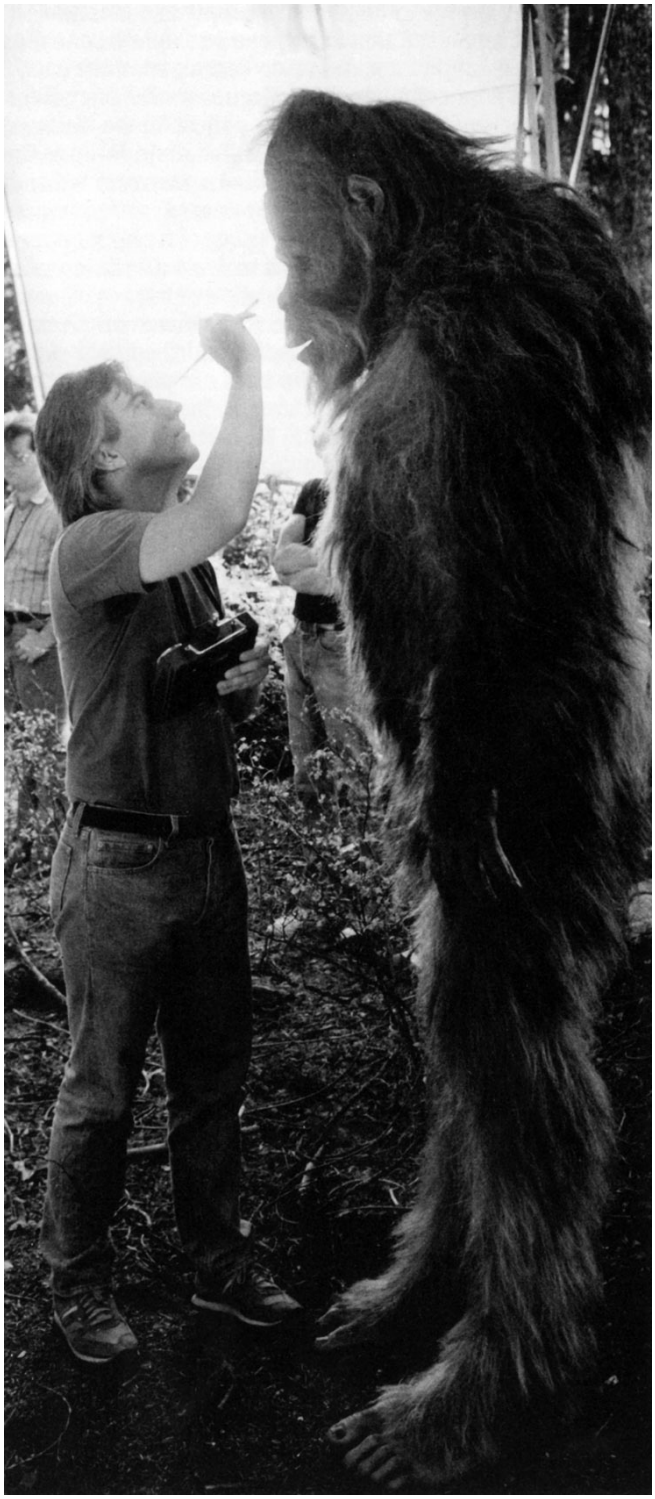
Baker worked in concert with puppeteers Tom Hester and Tim Lawrence to effect Harry's remarkable range of expressions. Director William Dear had stressed from the beginning that he wanted Harry to be treated like any other actor in the film — not the simplest thing to do considering Harry required the coordinated actions of three separate operators and the actor inside. "Actually, we never rehearsed anything on Harry," Baker related. "We just shot him like an actor. The three of us who operated him eventually got to the point where we could link our brains together and just go off whatever Kevin was doing. Although we were usually in different parts of the room with our little joysticks, we were somehow able to make him work really well. Kevin was extraordinary as Harry. Not only did he have the right physical presence, but the emotion he managed to convey through his eyes really gave the character life."

When it came time for the Academy of Motion Picture Arts and Sciences to select their nominees for the 1987 makeup Oscar, the producers of *Harry and the Hendersons* received a letter congratulating them on the selection of their film for Academy consideration, while stating that the work done by Rick Baker and his crew would be disqualified. "I called up the Academy and asked them why they had disqualified me — I mean, who's the expert on this type of makeup? They said that someone had called and told them that Harry wasn't makeup, that he was all done with servo motors. I said: 'So if some anonymous person tells you my work is not makeup, that's enough to disqualify me from the award? Good to know!' Finally, they arranged for me to come down and show them what I did. I explained that the director had wanted Harry to be able to make all these expressions as he moved around, and that he wanted Harry's head to be much larger than costar John Lithgow's head — and Lithgow's not a small man — so to achieve the proper effect, I had to use motors to move certain areas. They said: 'Well, you admit it yourself — you used motors. You're disqualified.' I said, 'Are you trying to tell me that if I had done this huge head as a solid foam rubber mask that didn't work when the actor moved his face, it would qualify as makeup, even if the movie was a flop because of it?' And they said: 'Yes. This way it's all done using motors.' I said: 'No it's not! Those are Kevin's eyes — it's glued down to his face and he operates part of it.' Then

they had me go outside and took a vote on it, and I guess I squeaked by. When the heads of the makeup union and other makeup artists heard about my nomination, they didn't like it; and when I went down to present my ten-minute effects reel to the committee members, the head of the makeup committee made a speech where he said that some of what they were about to see was not really makeup, they were mechanical effects. It got pretty ugly because *Rob Bottin* — who also had some mechanical makeup effects work nominated that year — got into a shouting match with the guy. I just kept quiet until it was my turn to show the reel from *Harry.* Afterwards, Ed Asner — who was one of the committee members — came up to me and said, 'I guess your work is one of the ones that's done with mechanics?' I said, 'Yes.' Then he asked me why I did it the way I did and I told him. He said: 'Sounds like makeup to me. Very nice work.' I got the nomination — and eventually the award."

While Baker was still on *Harry and the Hendersons*, he was contacted by producer Peter Guber about working on a documentary to be shot in Africa by wildlife photographer David Hughes. Guber called his project *The Missing* Link, hoping to remove the documentary stigma and make the project more appealing to audiences by adding a missing link character to tie the various wildlife segments together into some kind of story. As it turned out, Guber not only wanted Baker to make *The Missing* link suit, he wanted him to play the part. "He really succeeded in talking me out of it," Baker laughed. "He said, 'This is going to be great — you're the only actor in the movie, the star of the movie, so it'll be just you and the cameraman out in the middle of nowhere, and you'll be asleep and you'll wake up and you're right in the middle of a herd of elephants' — Peter's a really fast-talking guy — 'and they're stampeding and you have to run to get out of the way.' And I thought, 'Boy, do I not want to do this!' It was like, 'Quick, there's a stampede — put the suit on and get in the middle of it!'"

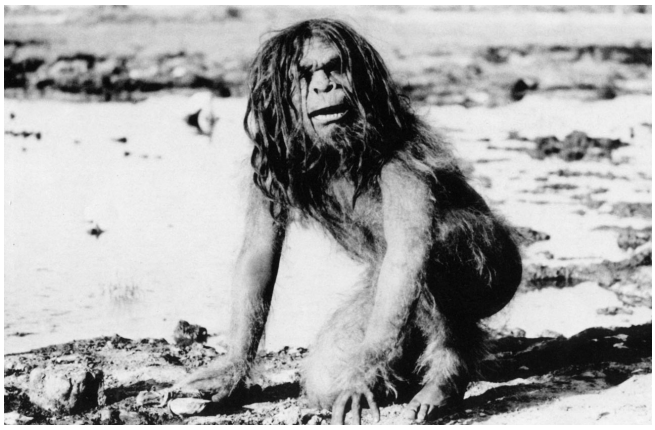
Baker somewhat reluctantly accepted the fabrication aspect of the job, primarily as a means to keep some friends employed and pay a few bills between bigger projects. "The problem with this show was that there was only a two-person crew — David and Carol Hughes — and the guy who wore the ape suit out in the middle of Africa. I recommended Peter Elliott, who was one of the *Greystoke* apes, and he was hired. We had to make a suit that would last and work. Tom Hester did almost all of it. He sculpted the character's head, and Stuart Artingstall, the hair knotter who did *Harry* and *Greystoke*, made the hair suit. There was no one to take care of the suit other than Peter; so I showed him how to maintain it, but I was really concerned that it wasn't going to work very well. It was fine, however. The ape character looked okay and the show had some beautiful wildlife photography— but it ended up going straight to video."



On location in Washington state, Baker performs some last-minute touch-up work on Harry prior to one of the forest scenes. Inside the suit was seven-foot-two Kevin Peter Hall, an actor whose physical stature and ability to convey emotion in heavy makeup made him a favorite of Baker's.

On the heels of *The Missing Link* came a series of projects for which this phase of Baker's career will always be remembered — Coming to America, *Gorillas in the Mist* and the *Beauty and the Beast* television series. "When I was approached to do the makeup for *Beauty and the Beast*, the producers said, 'We want this *Beast* to be attractive to women, but he still has to be a beast.'" Baker resolved this paradox by resorting to an earlier makeup he had created in an unsuccessful bid to win the 1977 remake of *The Island of Dr. Moreau*. "I wasn't established at that point, so I did a couple of different makeups — a baboon-man and a lion-man. I did the lion-man on myself. It wasn't quite as attractive as the *Beast*; but even then I thought it would be a neat beast makeup, and that was in the back of my mind when the producers talked to me about the TV series. When they said they wanted an attractive *Beast*, I realized this was the time to do the lion-man — and it's actually pretty similar."

Because Harry had to be mobile much of the time, the cable-actuated facial mechanisms favored by most effects artists were rejected and radio-controlled servo motors used in their place. Puppeteers Tom Hester, Rick Baker and Tim Lawrence put Harry through his paces while director William Dear emotes in response.



For The Missing Link, a quasi-documentary shot in Africa, Baker and Hester devised an early man makeup for actor Peter Elliott.

In preparing for the hopefully long-term assignment, Baker recalled his early experience on The Incredible *Melting Man* when the actor playing the title role became claustrophobic and could not tolerate wearing the makeup. "The first thing I said was: 'What you need to be concerned with is finding somebody who will wear the makeup. I knew there were a lot of out-of-work actors who would say, 'Sure, I'll wear the makeup — no big deal,' but I felt to do a series, to be made up every day, was going to be a horrible, grueling experience for someone. I can't blame an actor — it's not a pleasant thing to sit still for four hours and have someone stick glue all over your face, especially on a TV series where the hours are ridiculously long anyway. There were several actors they were considering, and Ron Perlman — who was one of the Neanderthals in *Quest for Fire* — was among them. So I said: 'This guy has worn makeup — he knows what he's getting into. If he's willing to do the show, I vote for him.'"

In championing Ron Perlman to play the sensitive Vincent, Baker had set himself a difficult challenge. Though a fine actor, Perlman had features that tended to be brutish, not refined and sexy as the producers had envisioned their *Beast*. Baker rose to the challenge with another entry for the record books — an effects makeup that actually made the actor look better than he did without it. "I began by asking for an eight-by-ten photo of Ron and then used an acetate overlay to design the makeup over his face. For the most part, the makeup was a one-piece appliance. Part of it covered

the end of his nose, then it flared out over his cheekbones and came down onto his cheeks. I wanted to make the appliance all the same piece, but the eyebrow covers had to be separate because Ron's eyes are so deep-set that there was an extreme undercut under his brows and I couldn't get the mold to release. As I was finishing the makeup, I thought, 'Hmm, he's probably going to be better looking as the *Beast*.' And he was. I like Ron a lot, but even his business manager came up to me and said: 'Never in my life did I imagine that Ron would be a sex symbol. I've got to thank you for this!' I loved it. And Ron enjoyed wearing the makeup because women liked him — which was probably one of the reasons he was so cooperative."

The sophisticated, yet simple makeup was applied daily — with probably the highest standards ever seen in television — by Margaret Bessera. From literally an inch away, the edges were invisible. "That's the way most of my makeups look on set," Baker observed, "because I let the actor's face determine where the blending edges go, and I put them in places where they won't be too obvious. A lot of people make the mistake of doing really straight edges on things; but my pieces have different shapes to them, so it's hard to find the edge. Margaret did a great job; and I kept telling the producers how fortunate they were to get somebody who really cared about the makeup and who would take the time to put it on properly. I was afraid they were going to lose her and I was going to have to train somebody else who wasn't going to do it right; but thank God, she stayed with it all the way through the end."

During the run of the show, Bessera made Perlman up hundreds of times, necessitating a separate '*Beast* unit' at the Baker shop to produce the vast number of pieces. "Keeping the pieces from our duplicate molds true to the design of the original piece was very difficult, because plaster nowadays is worthless. The quality has really gone downhill. It's impossible to run a mold very many times before it falls apart — and for *Beauty and the Beast*, we had to supply at least ten appliances for each episode. We came up with a system of reproducing the *Beast* true to the original sculpture by making epoxy negative molds off a silicone master. Then we clay-pressed out the appliance on a life-cast of Ron and recast that to make our new mold in order to get a good edge. We made a lot of appliances, but we'd reject a lot of them as well — out of every five we ran, we'd get one that was usable. We'd have to do all this while we were working on other shows; so I had to have somebody who did nothing but run the *Beast* molds every day, sort through the appliances, scissor out the nose holes, clean them up, put them on little vacuform heads and set them in a box."

The makeup work on *Beauty and the Beast* earned Emmy nominations for each of the two years the show was on the air. It also brought Baker to the attention of other television producers anxious to bring his sophisticated artistry to the small screen. Baker allowed himself to be persuaded into accepting two lesser projects— *Werewolf* and *Something Is Out There*. "It all started when I got a call from producer John Ashley saying, 'I'm going to do a TV series about a guy who turns into a werewolf and I'd like you to do it.' I was doing *Beauty and the Beast* at the time, so I said, 'I'm pretty busy, I don't think I can do it; but are you the John Ashley who was in *Frankenstein's Daughter* and all those bad Philippine monster movies?' And he went, 'Yeah!' I said, 'Okay, I'll talk to you.' So he came over, and I said, 'I really can't do the show, but I'll do some designs for you' — just because he was John Ashley and I liked all those bad monster movies. I ended up doing a couple of maquettes of the heads and a series of drawings. I recommended Greg Cannom to do the work and promised I'd watch over him. So I told Greg how I thought the werewolf should be built and that was the extent

of it. It turned out that Ashley had a complete collection of all of his movies on tape, so I said, 'That's part of the deal.'"

In addition to a complete collection of John Ashley films, Baker got the chance to handle another project for the *Werewolf* team — a pilot and short-lived series called *Something Is Out There*. "The producers knew they wanted a monster, but they didn't know what kind of monster they wanted; so I convinced them that it should be some kind of big insect creature because I'd never done one and always wanted to. We built the monster, and even though the whole suit was fabricated from cut foam, it had neat things about it. There were also a bunch of effects as the monster took over people's bodies and then split out of them; so we did some neat gelatin heads of people for these weird insect appendages to split through. The problem was doing stuff that could be shown on TV. We had to tone down most of it. The show was filmed in Australia and they were sending me dailies while I was doing *Coming to America*. I was actually cutting them together to look at the stuff, and there were some neat shots of the bug monster — but they didn't use any of them. In the final cut, you hardly saw the monster — and what you did see of it were not the shots I would've picked. The first time you really see it was a shot after the director said 'Cut!' and the guy in the suit stood up in between takes — that's what they used! The stuff I cut together probably showed the monster too much, but I thought they were better shots than what were used. The pilot was relatively successful as far as ratings because it had a monster in it and a bunch of makeup effects; but the series had none of that, which is probably one of the reasons it failed."

For the CBS primetime television series, Beauty and the Beast, Baker was commissioned to design a sexy Beast makeup that would eventually be worn by actor Ron Perlman. He did so by modifying a lionman concept he had developed years earlier in an unsuccessful bid to win another project Applied on the set by Margaret Bessera, the deceptively simple makeup would earn Baker Emmy nominations for each of the two seasons the show was on the air.

While *Something Is Out There* was shooting in Australia, Baker was busily taking lifecasts of Eddie Murphy and Arsenio Hall for what would prove to be the most ambitious and challenging use of character makeup in his career — *Coming to America*. Directed by John Landis, with whom he had worked often in the past, the story concerned the quest by a wealthy African prince to find true love in the slums of New York. Though the role was a fairly straightforward leading man part for Eddie Murphy, the actor was given the opportunity to explore some broader characterizations by playing — in disguising makeup — a talentless lounge singer, an argumentative barber and an old white man. Costar Arsenio Hall — playing servant and companion to the prince — also essayed a few outlandish cameos.

Baker was somewhat concerned about working with Eddie Murphy because he had heard the actor was difficult — and their relationship did get off to a shaky start. "On the day we were going to take his lifecast, Eddie showed up at my shop with twenty people! He was here to have a party and all these guys were having fun while Eddie was entertaining them. Meanwhile, I was trying to take a lifecast. We did the back half of his head first using plaster bandages, and I had to physically grab his head and hold it still as we were laying the bandages on because he wouldn't stop moving around and telling jokes. When I got the back done, I figured that would hold him still; so I let go while we were mixing up the alginate, getting it ready to put on his face, and he got out of the plaster bandage shell and was leaning forward talking to someone. At that point I screamed, 'Aaargh!,' pushed him back in the shell, put the alginate on him and held him down at the same time. The lifecast worked out fine, actually, which surprised me; but afterwards, I said to John Landis: 'These are going to be hard makeups, and I can't do them while Eddie's having a party — I need him in a room by himself. You're the director — you talk to him.' John said: 'I'm not going to talk to him. You talk to him.' So I talked to him. I said: 'Eddie, I'd really like to do these makeups. I think it could be some really neat stuff. But it's very tedious, very hard work. I need your concentration, and *I* have to be able to concentrate, so I can't have you entertaining people at the same time.' And he said, 'Okay.' Eddie turned out to be one of the best people I've ever made up."

For both Baker and Murphy, the entire point of putting the actor in makeup was to radically alter his appearance so that audiences would not recognize him — but the studio executives disagreed. "Paramount got really concerned when we showed them the videotape of Eddie as the old white man because they couldn't tell it was Eddie. I said, 'Of *course* you can't tell it's Eddie — he's supposed to be a white Jewish guy!' But they worried. 'Maybe we should've just painted him white. Why are we having Eddie play these parts if we don't know it's Eddie?' Eddie didn't *want* everybody to know it was Eddie, but Paramount felt differently. When I created the makeup for the Randy Watson character — the bad entertainer — I actually thought the test makeup looked too much like Eddie; so I went beyond the thickness you should ordinarily make the appliance pieces in order to distort his features. The first time I applied that makeup was the day we filmed it, and I was really worried that it wasn't going to work, but I think it was actually one of the better makeups. To appease Paramount, on the last makeup I did — the barber — I decided to keep a little more of Eddie in it; but that was the one I was least impressed with because you could tell it was Eddie Murphy."

While the actor's barber makeup may have been straightforward — consisting of cheek appliances, a nosepiece, and a forehead piece — his old Jewish man makeup was the most elaborate due to the fact it represented the most extreme change. "I was trying to hide his black features and also make a character that was believable," Baker recalled. "The makeup was in fifteen different overlapping appliances, not including the hairpieces or the teeth — all of the makeups had teeth. Usually overlapping appliances in an old age makeup don't really build up very much, but because I had to change the structure of Eddie's face so much, some of the pieces were thicker than they would ordinarily have been, which made the overlapping appliances a lot trickier to make. I was worried about them not lining up the way I wanted; but finally I was pleased, even though there were things that unfortunately didn't show up on film. We actually punched hair into the hand appliances, so they were really convincing in person. We also added close-cropped hairs near the base of the neck. We even had nose hairs and hairs in his ears."

But those details made the makeup believable in person — and Eddie Murphy had a field day with it. “The thing I enjoyed about working with Eddie was that he had fun with the makeups. I had just finished making him up as the old man, but when they weren’t ready for him yet on the set, he said, ‘Okay, I’ll be right back,’ and he got into his little golfcart and took off, terrorizing all of Paramount. He went into executives’ offices and tried to sell them scripts as this old Jewish guy. He made a date with some old woman who was a secretary and nobody knew who he was. When I made him up here for the test, he wanted to go out Christmas shopping! He said, ‘At least I won’t be harrassed by people.’ And I said, ‘Yeah, but I don’t think they’re going to take your credit cards.’ Eddie really had fun, which is part of what interested me about makeup to begin with, that you could become something that you’re not and you could fool people. Eddie went out and actually did it. As I put on each piece, he would look at himself in the mirror, work with it, see what it did. He took every minute he wore that makeup to learn how to make it work and he really enjoyed the experience.”

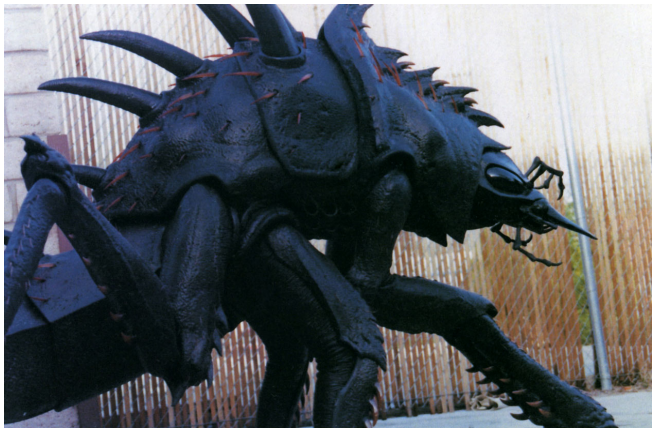
Application duties were divided between Baker and Greg Nelson —with Baker applying the Eddie Murphy makeups and Nelson working on Arsenio Hall. “What amazed me is that they actually stayed on. Eddie was very good about sitting for the makeup, but he wasn’t very good about being careful with it afterwards. Usually I try to get people to not talk or eat between takes, but Eddie didn’t care — I’d get him all made up and he’d eat a hamburger. He and Arsenio would do outrageous routines between takes — they did a lot more funny stuff off-camera than they did when they were filming. They’d scream and laugh and open their mouths as wide as they could, and I was thinking, ‘Oh, Christ!’ but the makeup stayed on great.”

Baker enjoyed the challenge of *Coming to America*, and he liked getting back to his roots and creating makeups that his critics could not argue with. “It was fun to do normal makeups with no mechanics involved — but there was pressure, too. I was really worried about doing that old Jewish man, because Eddie Murphy is definitely a black guy and because it’d been a long time since I’d done human makeups. I remember talking to Dick Smith and telling him I was going to do this show, and he said, ‘Oh, this is going to be interesting to see if Mr. Monster here can make a human!’ He was really putting the pressure on me, and I started sweating it out as I was sculpting this old Jewish guy, thinking: ‘Oh, man, I don’t know. Dick’s going to be really watching me, so I’d better make this work!’ But I was really pleased with it.”

It is difficult to judge which is the tougher assignment — turning Eddie Murphy into an old Jewish man or building a gorilla suit so believable as to pass for the real thing. The quest for the perfect ape suit has been the holy grail to effects men since silent pictures when ‘ape’ performers such as Charlie Gemora and Ray ‘Crash’ Corrigan pioneered the techniques Baker has spent a lifetime trying to perfect. No effects man in history is more identified with apes than Rick Baker — except perhaps Willis O’Brien whose work was in another vein. From his humble beginnings with *The Thing with Two Heads* and *King Kong* to his bravura work on The Incredible *Shrinking Woman* and *Greystoke*, Baker’s apes have evolved in true Darwinian fashion. But his next film, *Gorillas in the Mist*, would test the master to the limit. It was one thing to build a great ape suit and another for that suit to intercut convincingly with real gorillas. In the film biography of naturalist Dian Fossey — who spent thirteen years studying the mountain gorillas of Rwanda — that was exactly what Rick Baker’s suits were expected to do.

Two short-run television assignments were presented to Baker in the wake of his high-profile work on Beauty and the Beast. For the first — Werewolf — he produced a series of drawings and sculpted maquettes before turning the actual construction over to Greg Cannom.

The first thing that had to go was the notion that any gorilla mask designed to match the proportions of the human head could possibly intercut with a real animal. In all of Baker's previous gorilla work, the actor's eyes had been incorporated into the makeup — which was not anatomically accurate, but was simpler to achieve and more believable than anything mechanical. On *Gorillas in the Mist*, because of anticipated shot-to-shot intercutting, fully mechanized gorilla heads had to be made with mechanical eyes. One of the principal characters was Fossey's simian soul-mate — a silverback male she named Digit. "As with Harry, Digit's head was all radio-controlled and self-contained," Baker noted, "but that's where the similarity ended. Harry was partially operated by the wearer, but the actor who played Digit really had very little to do with anything but the gross movements of the head — even the mouth and eyes were operated remotely. The actor's eyes actually lined up with the mouth, but his head was really far back and all the mechanisms and servo motors were on top and in front of his face."



Soon thereafter, Baker was given free rein — within low-budget parameters — to design an alien monster for Something Is Out There. Opting for an insect creature — something he had always wanted to do — he devised a man-size suit fabricated quickly and economically from cut foam.

For the pilot of the same show, gelatin heads were manufactured by Gabe Bartalos and rigged so that insectlike appendages could be thrust through them. Most of the work proved too graphic for television.

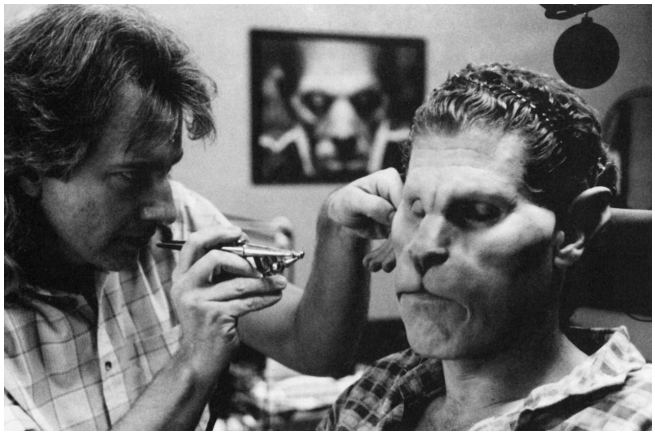
Baker knew he was taking a big chance using artificial eyes in his creation. Quite often, they can result in a loss of 'humanity' in the character. By substituting plastic lenses for real eyes, Baker knew he was in danger of creating a character that was only as deep as that plastic. "Eyes are really hard things to do," Baker admitted. "To get life out of fake eyes is very difficult; but because my gorilla suits had to match-cut to these real gorillas, we knew they had to have totally radio-controlled faces and that we couldn't use the actor's eyes."

Using radio-controlled eyes freed Baker up to do what no makeup artist had yet done — give the apes of *Gorillas in the Mist* the same proportions as the real primates they were meant to represent. "The mechanical heads actually helped us proportionately. Since Digit's head sat higher up and farther forward than it would've if we were using the actor's eyes underneath, we were able to build our whole suit to match the proportions of that head. We designed the character as a quadruped animal from the beginning, similar to the way I had done other gorillas in the past. We built an artificial pelvis piece that strapped onto the actor's back. Then we added a fake butt that really lengthened his torso. When we made our rubber muscle suit to fit under our hand-tied hair suit, we added a lot of rubber muscling to his legs to make them appear thicker and shorter. Unlike my other gorillas, we didn't cast Digit's chest. Instead, we constructed it from spandex material that

was sewn into the proper muscle pattern. Then we added plastic beads under the skin to simulate the gooseflesh that gorillas have in that area."

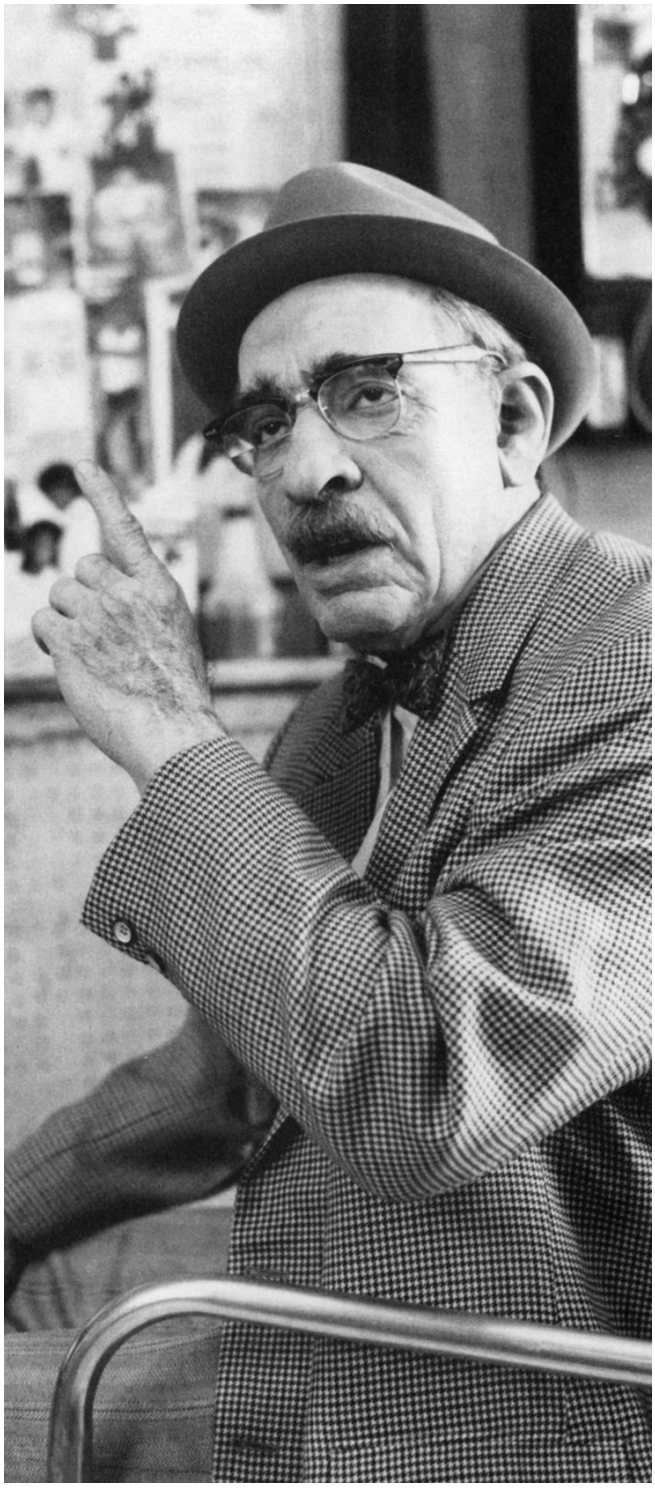
Gorillas in the Mist afforded Baker the opportunity to realize a lifelong dream. Together with director Michael Apted and actress Sigourney Weaver, he flew halfway around the world for a preproduction trek into Rwandan gorilla country. En route to the mountains, however, Baker fell ill — very ill. "For days, I couldn't get more than six feet from the bed or the bathroom in my hotel room. It was awful. Every morning the rest of the group would get up and make the trek up into the mountains, and every night they'd return exhausted with great stories about seeing the gorillas. Finally, on the very last day, I dragged myself out of bed and made the climb. They took me to visit the group of gorillas they were going to use to interact with the actors — the ones that were most habituated to people. Then they pointed out the one they'd be photographing the most — a silverback they were going to use as Digit — and I took a bunch of pictures. So the sculpture for the character of Digit was based on a specific silverback — I did virtually a portrait of that gorilla — and then they used another one! The gorilla they ended up using the most had much more red on the top of his head, so we were able to change the hair on our mechanical head to match that at least, but his face looked a lot different. It cut together well, but I can see the difference. Their attitude was — and I think they were right — that all gorillas look alike to most people. I found that out on *Greystoke* when I tried to make all of the ape characters distinctive. Most people couldn't tell the difference between them even though they were radically different."

Although a skeleton crew would return to Rwanda to obtain footage of Sigourney Weaver interacting with real gorillas, most of the film — and all of the effects work — would be accomplished in the mountainous Aberdare region of neighboring Kenya. With a small team of mock gorilla wranglers — puppeteers Tom Hester and Dave Kindlon, mechanics experts Randy Simper and Phil Notaro, and seamstress Camilla Henneman — Baker arrived at the eleven-thousand-foot location ready to work. "The main unit had already been shooting for some time, and it was pretty rugged. To house everybody, there was a giant tent city with about three hundred tents. We were given a couple on the outskirts of the compound and people kept telling us to watch out for lions. We thought they were putting us on, but we later found out they weren't. A steady stream of wildlife wandered very close to our tents — especially at night. We needed workspace and we needed electricity, so the company erected a building for us and we ended up spending about six weeks shooting Dian's first contact with Digit and the gorilla's death at the hands of poachers. John Alexander — another of our *Greystoke* apes — played Digit. He was terrific. Even at that altitude, where the rest of us were gasping for air, his stamina was incredible. And it always amazed me how he could move around and find his marks even though he was totally blind in the closeup head — all the motors were right in front of his face." After the Kenya shoot the makeup unit moved to Shepperton Studios in England where the most demanding mechanical material was accomplished on stage.



During a test application of the Beauty and the Beast makeup, Baker uses an airbrush to blend facial appliances affixed to Ron Perlman.

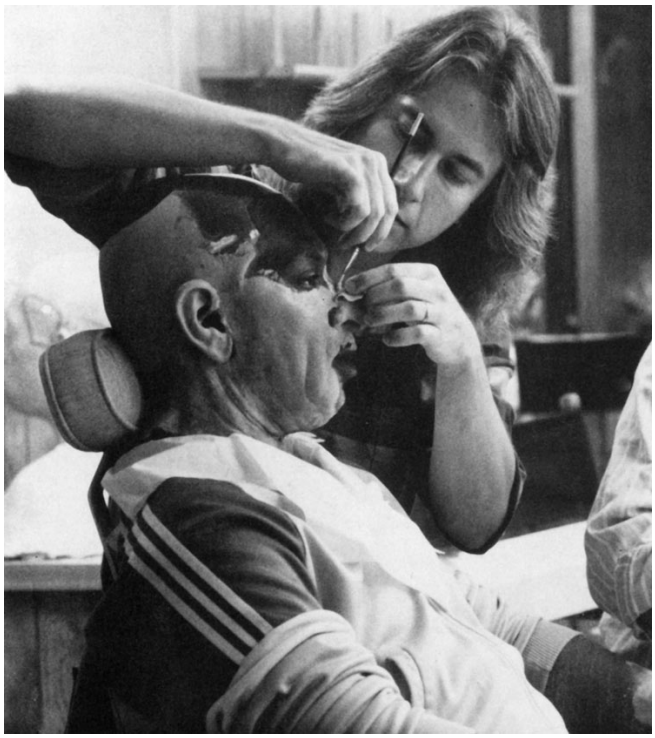
Baker earned a 1988 Oscar nomination for his work on Coming to America. The objective was to transform actor Eddie Murphy into a trio of supporting characters. Included among them was a talentless lounge singer. Baker used extensive prosthetic appliances to disguise the actor's underlying features.



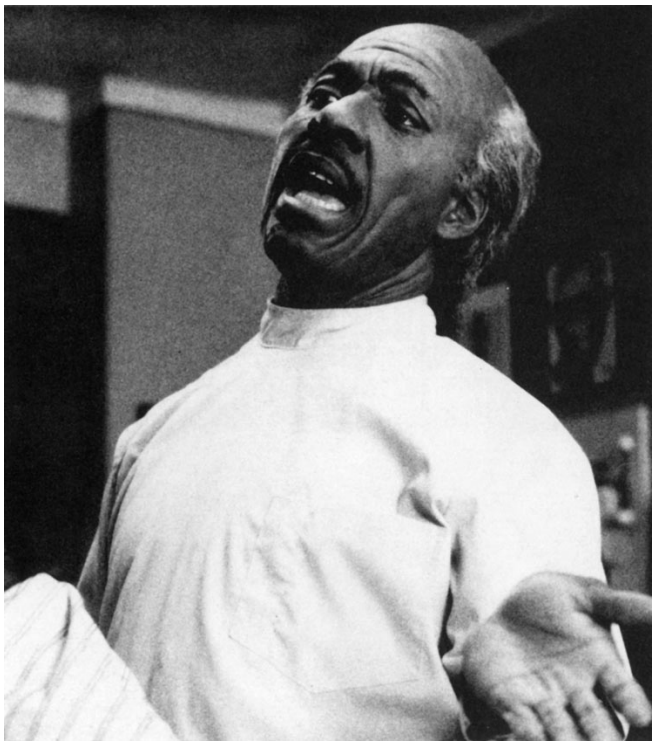
The most elaborate makeup was the transformation of Murphy into an old Jewish white man.

When Baker was first approached on *Gorillas in the Mist* and informed that the filmmakers planned to intercut his fabricated creations with real gorillas, he had replied that there was no way he could build one that believable. He would live to prove himself wrong. But is it the ultimate ape suit at last? "I think so. If I never build another, I think I can be happy knowing that the one I built for *Gorillas in the Mist* will probably be the ultimate ape suit. For it to cut together with the real apes as well as it did — you can't do much better. There are little things I would probably do differently, but I think I've got it out of my system. With anything I do, I try to make the ultimate of whatever it is; but making that perfect gorilla was a lifelong ambition."

As fate would have it, though *Gorillas in the Mist* and *Coming to America* were made a year apart, both films came out the same year and it looked as if Baker might be competing with himself for the Academy Award. But he need not have worried. "We weren't even nominated for *Gorillas* because of the makeup committee's view on what makeup is and is not," Baker sighed. "It seems that each year they try to redefine it to eliminate what I do. Since I won for *Harry and the Hendersons*, they changed the rules again so that if any mechanics are used whatsoever, regardless of how else the makeup is achieved, the work is eliminated. Unfortunately, I work in an area that doesn't fit into any of their categories. I'm amazed that I managed to get two of their awards; but what disturbs me about it and makes it a sore point is that I feel used. Traditional makeup artists keep saying, 'We fought for forty years to get this award.' And I say: 'Yeah, and who got it for you and what was it for? It was for the kind of stuff that I do and Dick Smith does and *Rob Bottin* does.' Most of the awards that have been given out have been for special makeup effects, but these guys claim that special makeup effects shouldn't even be considered. They let the popularity of our work get the award category for them, and then they turn around and ace us out."



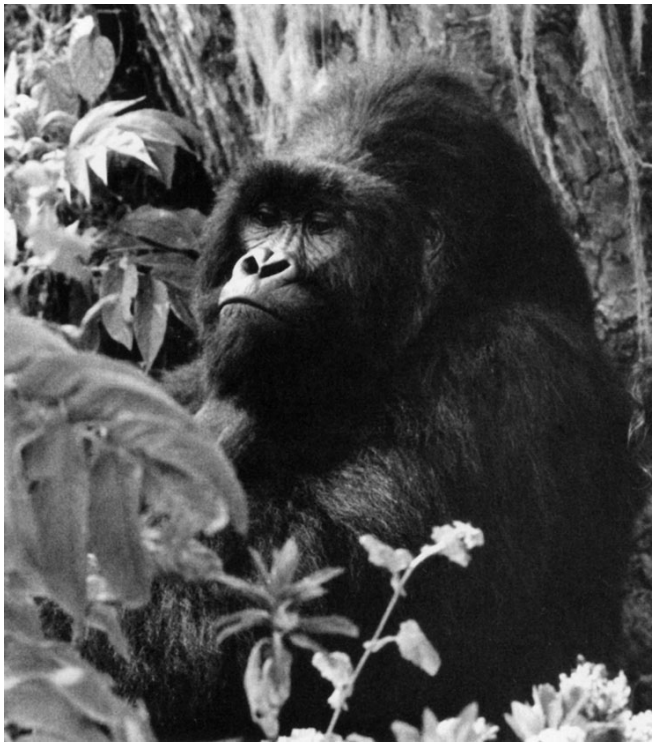
Baker applies overlapping pieces of his transracial makeup to the actor.



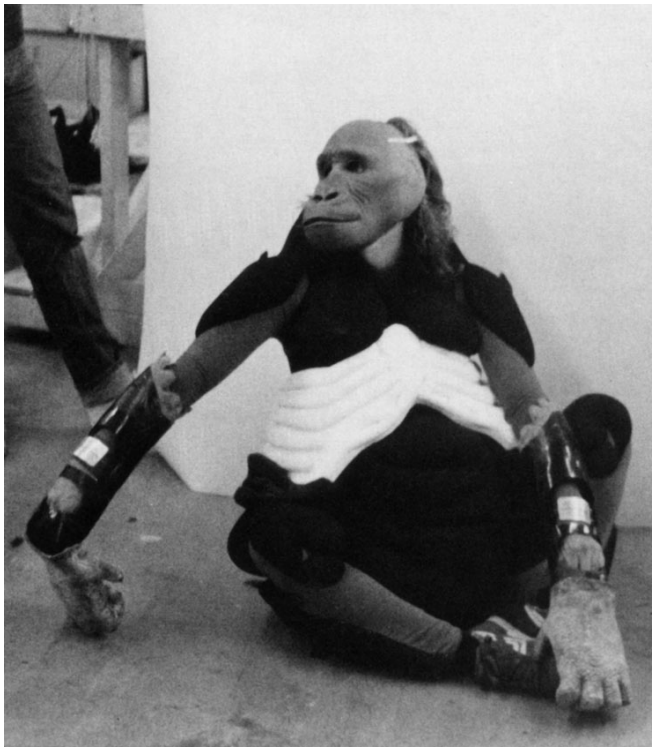
When studio executives objected to the fact that their star was unrecognizable in the makeup — which was the point of it for both actor and makeup artist — Baker made the final barber character more identifiably Murphy.

But there was still his excellent work in *Coming to America* — and that could not be disqualified no matter how antagonistic his detractors were. Once again, Baker seemed a shoo-in for the award. "That's the thing I thought was so funny about the Academy Awards that year," Baker observed. "*Gorillas in the Mist* and *Coming to America* are two of the better things I've done and I didn't get an award for either one of them. I figured this would be a year that I wouldn't have to argue with the makeup committee, but I lost the Academy Award to *Beetlejuice* — I actually felt bad about that. But the obvious things are what people see — I've won because of that myself on occasion. I think a lot of people saw *Coming to America* and never realized there were makeups in it."

Just prior to taking on perhaps the largest effects job of his career, *Gremlins 2*, Baker received a phone call from Michael Jackson imploring him to help complete the pop star's latest multimillion-dollar video *Moonwalker*. Two years earlier, when the ambitious project was begun, Jackson's manager had contacted Baker about handling the effects from the outset; but Baker was skeptical. "When he said Michael wanted me to do some more transformation stuff for another video, I said, 'What's he turn into now?' 'He turns into a jet plane and a race car.' 'Well, I'm pretty busy,' I said. Then Michael contacted me personally. I told him I couldn't possibly do what they wanted in the relatively short amount of time they had. Finally they came back and asked me to take a cast of Michael's head and body because he was comfortable with me — they were going to use the casts to plot some computer generated stuff — so I did the bodycast and that was the end of it."



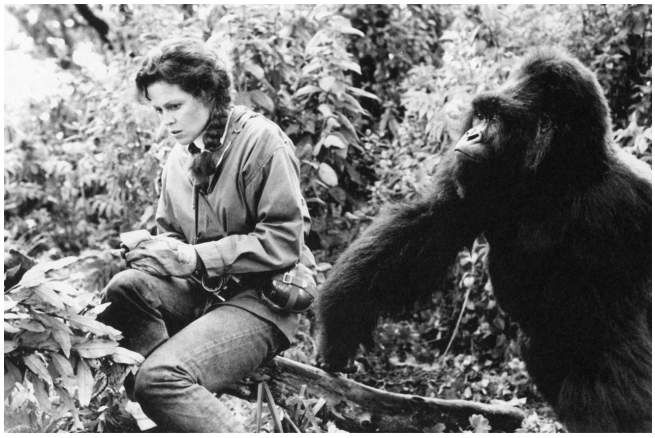
Though realistic ape suits had long been a personal obsession with Baker, he had never been called upon to produce one with such total verisimilitude that it could be intercut with real apes — until Gorillas in the Mist. For the 1989 film biography of naturalist Dian Fossey, Baker was tasked with producing a flawless family grouping of mountain gorillas.



Wearing a gorilla mask and a prototype fat suit Baker tests some mechanical arm extensions in his shop.

Principal gorilla performer John Alexander relaxes between shots.

Or so Baker thought. “Two years later, I got a call from Michael: ‘Rick, you’ve got to do this one shot. A bunch of different people have tried it and nobody’s been able to do it and I’m not happy with it and we can’t release the video.’ So I said, ‘Well, okay.’ They wanted me to do the beginning of this transformation — which had been handled mainly by Lance Anderson, but different people did various things for it. Michael had had this idea that he should start out the transformation by sweating mercury. They showed me the stuff Lance had done, and I said, ‘I can’t do anything much better than what was done here, but I think the real problem is that it’s a bad idea.’ Nobody had told Michael that the idea was no good — they were afraid of him, I guess. I said, ‘I think it’s ugly and Michael Jackson shouldn’t be ugly.’ That got to him and he said: ‘You’re right, you’re right! So what’s it going to be?’ ‘I don’t know, but we’ll think of something!’ Then I thought: ‘Oh shit, I’ve opened my mouth. Now I’ve got to do it.’ They already had footage Lance had done using replacement animation to transform Michael’s features into a chiseled robot face, but the effect didn’t work well because the registration was off. I felt the robot could look prettier, so I had Matt Rose do a series of sculptures of these faceted Michael Jackson faces, which were really nice, while Jim Leonard and I figured out a way to do the molds for the transformation so that everything registered.



In an early encounter with the gorillas, Fossey (Sigourney Weaver) is approached by the dominant silverback Digit with whom she would form a lasting bond. Though earlier Baker ape suits had incorporated the eyes of the actor within, precise anatomical accuracy dictated that the heads for Gorillas in the Mist be fully mechanical.

Digit charges a band of poachers.

“We also came up with the idea of having Michael’s face first turn silver magically, open up and expose all of these mechanical parts and then, when it went back together again, have it become an entirely different face on a motion control puppet. We did a prototype head that was servo driven, not motion controlled, to show what it could do and to figure out the geometry of how it was going to come apart and go back together. Then we made a whole body of Michael looking like Michael, as well as the servo-Michael with the face that came apart. Eric Allard and his company, All Effects, took the prototype heads and duplicated them and made all of the actual motion control parts. Then we shot it at Dream Quest. It was six months of work for a few seconds of film.”

By the time the *Moonwalker* project was completed, Baker was well into production on *Gremlins 2* — an assignment he undertook with considerable hesitation. Warner Brothers had wanted to make a sequel to *Gremlins* ever since the first film became a runaway success at the boxoffice, but no one was happy with any of the reported dozen or so scripts that were written. Finally, director Joe Dante and producer Michael Finnell had a draft script in hand that everybody seemed to like and the search was on to find an effects team capable of taking on the gargantuan workload. “I got a call

one day from Joe Dante and Nike Finnell to come out and talk to them about *Gremlins 2*. There was a draft of the script everybody seemed to agree on, but it was still really rough. What there was of it had the gremlins in this tower with a Donald Trump character, and then the gremlins take over the tower and that was it. After they told me the basic story, they asked me if I was interested and I said I'd think about it. After I thought about it, I said, 'No.' I enjoy the designing part of projects the most and I felt that part was basically done. I also like doing the work, but I knew I would have to have such a huge crew for a job of this scale that I would end up being a department head, basically, who had to babysit his crew. That didn't seem like fun to me, so I said, 'This job looks like too big of a headache and I don't want it.'"

But for Dante and Finnell, there was no other choice. Chris Walas, who had done the first film, was busy directing *The Fly II, Rob Bottin was on Total Recall, Stan Winston was doing Leviathan*. "Everybody in town was working — there wasn't anybody else. So they said, 'Oh, please!' But I'd pretty much made up my mind. Then I started getting calls from Warner Brothers executives saying: "Rick, you know we've always had a good relationship in the past. Joe and Mike are good guys. It'll be fun!' One of them kept sending me stuff like Warner Brothers T-shirts and the *Gremlins* paperback. Finally Joe and Mike said, 'What can we do to make you want to do this?' And I said, 'Well, if I can change the gremlins and make them a little more real; and if I can make all the mogwais different instead of looking basically the same, and have those mogwai characteristics transfer into those gremlin characters; and if we could make the movie about the characters, instead of about armies of gremlins, then I'll do it.' They said, 'Do anything you want, anything, but do it!'"

Baker and his crew spent six weeks in Kenya shooting scenes of Fossey's first encounters with the gorillas and the death of Digit defending his family from poachers. With a small film crew, Sigourney Weaver had journeyed earlier to the volcanic rain forests of Rwanda where she had been photographed working in close proximity to real mountain gorillas. The Baker gorillas were used to provide connective material and footage that could not be obtained with the highly endangered primates.

Thus the deal was done. Baker was allowed to have input on the script, and he began creating gremlin characters with Dante, Finnell and writer Charlie Haas. "I was hoping we could really develop the film around these characters and their antics, like a *Bugs Bunny* cartoon. I didn't particularly want to make another version of *Gremlins* — I wanted to make a film that was something more than pushing gremlins into microwaves and blenders. I suggested we create a Daffy Duck kind of gremlin, and have a big, stupid one called Lenny and team him with a little guy called *George*. It was all ripoff stuff, nothing original; but I said, 'Let's do some really neat stuff and make a three-dimensional cartoon.' That's what I wanted to do, and I figured Joe would like it because he loves old Tex Avery

cartoons. They all said, 'Yeah, yeah!' Joe and Mike made it clear that anything was possible in this building, so we could create all these different places for them to get into trouble. It seemed like they wanted my input — but it didn't turn out that way. When we eventually started seeing scripts, the characters weren't really in it — their names were in there, but there were no scenes about the characters. I kept saying, 'The script's okay, but the whole idea of different characters is lost.' They kept saying, 'Well, we'll think of some schtick for them to do.' And I said, 'Thinking of schtick is not the same thing as writing a movie about characters.'"

While the script was being reworked, Baker began assembling the core of what would eventually become a crew of seventy-some veteran and novice artisans. A major research and development effort was the first order of business. Baker was determined not to try and do it all himself. "I hardly did any of the real nuts and bolts work. I let other people do it because I knew I couldn't do it all. Also, I had a new wife who was pregnant and whom I wanted to spend time with. I actually went home at a decent hour — I didn't work till four in the morning sculpting. Basically, I let somebody else do that. Then I'd come in and critique it. The first thing I did was a painting of Gizmo and a painting of what I thought a garden variety gremlin was, because when I told Joe and Nike what I wanted to do, they said,'Whaddya mean make the gremlins more real?' Then I did some rough sculptures to get the concept of the characters, or at least to determine the kind of approach I wanted to take. Once we got the basic design locked down, I started handing out things to guys like Matt Rose — he did a lot of different characters that were right on the money as far as what I wanted."

Without a finished script, however, determining specific capabilities was difficult. "They just said, Make all the gremlins and mogwais do everything,'" Baker recalled with exasperation. "'That's a lot of things, you know?' Usually I base my puppets on what they have to do in the script. If a certain character has to climb stairs, then the puppet of that character has to be able to climb stairs, or dance or whatever else the script requires. On this film, we didn't have that luxury. We had to start building things without seeing a real script; so to be on the safe side, we had to build the same number and type of puppets for each principal character. The production spent a lot of money and we ended up building a lot of stuff that was never used."

On *Gremlins 2*, as on most of his more elaborate projects, Baker had his crew build things twice to make certain all the bugs were worked out before filming began. Baker was very interested in differentiating the small, furry mogwai characters and giving them a wider range of expressions than in the original film. "All the mechanics for the lifesize mogwais had to be self-contained, so Steve James had to figure out how to make a mechanism that would do everything and still fit inside Gizmo's little head. He made the mechanism for the life-size mogwais pretty simple — their mouths opened and closed, their ears wiggled forward and back and their eyes moved left and right and up and down. Their upper lids were able to blink and track with their eyes when they looked up or down, and the lower lids worked independently."

A major innovation was in the area of making eyelids that fit snugly against the eye and functioned without problems. "When eyelids are made of rubber and fit snugly, they will often roll up under themselves and then get torn. I could see the mogwai eyelids being a constant source of repair, so I said, 'Let's make hard eyelids.' Everyone thought I was nuts, but I realized that the only place the mogwai eyelids really had to be flexible was in the corners since the lids would disappear under

their heavy brow ridges anyway. So we went with cast hard plastic lids and made little appliances for the corners of the eyes. Those hard eyelids never rolled under on themselves and they always gave us a nice firm blink. They saved us a lot of headaches."

The eyes themselves were also a concern. "I got out every eye mechanism I'd ever done and looked at them and weighed the pros and cons of each one. Steve James and Mark Setrakian contributed some thought as well. We played a lot with having the irises work, but we never came up with anything that looked so incredible that it was worth the effort — also, it would have taken up that much more space in the head and added another function on the joystick. Eventually, we ended up with four basic eye functions — left-right and up-down. We didn't have room for a squint mechanism, so we just raised the lower lids to make them appear to squint, which was a little trickier to puppeteer."

For the original film, Chris Walas had made several replacement faces to give the mogwais a wider range of expression. It was a good idea in theory; but in practice the faces took hours to change, so as soon as filming ended on one day, Joe Dante would have to decide which face he wanted on the next. Then Walas' crew would spend the night removing one face and gluing on another — and they were stuck with that face for the whole next day's shooting. Baker liked the concept of having multiple expressive faces, but came up with a less time-consuming way of switching them. "We created a modular system which enabled us to pop different faces on our mogwais very quickly. Our foam mogwai faces were glued to vacuformed pieces that snapped onto the underskull mechanism — so the whole face would come off from the ears forward. The vacuformed face plate underneath each foam face kept the fit constant from one face to the other. With our modular system, we had a book of stills and we'd ask Joe which face he wanted next and we'd put it on. We made at least fifteen different faces, including a 'kissy' face, a sad face and an extremely sad face, but we used a generic face and the one we called the 'determined' face the most."

For the principal mogwais, double-size closeup heads were also built to effect a full range of expressions. Corresponding double-size hands and bodies were likewise used on occasion. Steve James took a somewhat unorthodox approach to the mechanics for the double-size puppets. While he used servo motors to handle most of the functions, he also decided to incorporate cable controlled mechanisms, both to save space and for greater strength. "We agreed that making the mogwais do really big smiles and frowns would be easier using cables since servos have limited strength," Baker noted. A decision was also made to hard-wire all of the servo motors — the rationale being that with so many different characters in the same scene, radio control would create too much interference. "I think that was a mistake. If I had it to do again, I'd do at least some of the stuff radio controlled. That's one of the great advantages of using servo motors — you don't have all these cables coming out. But since we knew we were going to have electronic cables coming out of the double-sized mogwais anyway, we decided we should do some stuff using push-pull cables because it would save time — we can make a cable controlled head in a day, whereas a radio control head can take a month!"

For the megabuck video Moonwalker, Baker and company used replacement animation to transform Michael Jackson into a robot.

In Gremlins 2, Billy Peltzer (Zach Galligan) has left rural Kingston Falls — no doubt still reeling from the gremlin invasion of the first film — and moved to New York City where his low-level job as a tour guide is imperiled by the unexpected reappearance of Gizmo the mogwai.

Anticipating that Dante would prefer using lifesize mogwais, Baker and crew created a virtual army of puppets for almost every occasion. “We made stuffed, loose floppy ones we could just toss around, and we also made ones that were completely self-contained with motors in them to work the arms and legs for scenes where they were picked up by someone. We had hand puppets without legs and puppets with radio-controlled arms and heads whose legs were bolted to the set but who could shift their weight from one foot to the other via rods in the floor. We built four types of puppets for all the main mogwai characters — except Gizmo. We built eleven different versions of him because he was the star and he needed to do a lot more.”

Although he had not been involved in the original Gremlins and resisted doing the sequel Baker was persuaded to participate at last when apparent enthusiasm greeted his suggestion that the malicious troublemakers of the first film be reconceived as cartoonlike characters with distinct personalities. Wielding a drill cross-eyed Daffy wreaks havoc in a dentist’s office.

One of the challenges Baker set himself from the beginning was to see if he could make an audience believe a mogwai could walk. “You never saw them walk in the first film,” Baker noted, “you always saw them picked up and set down out of frame. One of the main things Joe and Mike told me they wanted to accomplish in this film was to show that Gizmo had legs and he could move around.” After abandoning an early idea to build mogwai and gremlin suits big enough to fit a person, Baker opted to imitate a character made famous during the fifties in regular appearance on *The Ed Sullivan Show* — a puppet mouse named Topo Gigot whose legs were actually the extended fingers of his puppeteer. “Our idea was to have the puppeteer’s hand hidden behind the mogwai body with his fingers down inside the legs. Another puppeteer would use rods to move its arms while still another would operate its head from behind using a gimbal mechanism to move the neck.” Replacement faces were employed to alter expressions.

For the Topo-mogwais to work, they had to be matted into their surroundings to eliminate extraneous rods and operator arms that would otherwise be impossible to conceal. Some video tests during preproduction showed great promise. “We shot a sequence in my office using blue chroma key,” stated Baker. “We made some quick storyboards and had Gizmo walking on a countertop. Then I said: ‘Let’s do something fun with this. Let’s have him dance.’ I told Bart Mixon to set a cardboard box down and take off the lid as I turned a tapedeck on and Gizmo came sliding out playing air guitar. We shot the plates and put them together with the chroma-keyed backgrounds, and it turned out to really be a neat little sequence — he moonwalked and did all kinds of stuff. I showed the test to the guys at Warner Brothers and they went nuts. ‘We’ll put this in the movie — we’ll have Gizmo dance!’”

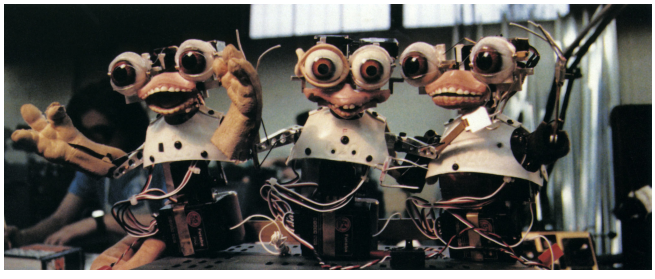
Unfortunately, when it came time to film the sequence for real almost a year later, Baker found that what had been relatively simple to accomplish on video was rather difficult to duplicate on film. “We found that it was a lot easier to chroma key stuff on video than it was to shoot bluescreen on film. We couldn’t get rid of the puppeteers. When we did our test, I just had the puppeteers dressed in blue wearing blue gloves, and they were positioned directly behind the puppet. I thought the closer we got to the puppet, the better the performance we could get. On video it was easy to lose

the puppeteers just by adjusting the key level, but we weren't able to do that on film because we couldn't get a good matte. Eventually we ended up not doing it bluescreen. We shot against black instead — which was a lot freer than bluescreen, but it still limited the puppeteering so much that Gizmo just seems to walk in the finished film. When I saw the temp composites of the scene, I told Joe to cut most of that stuff out and just use the hand puppet we'd shot dancing from the waist up. I felt that footage had a lot more vitality and was a lot more fun."

Not all of the matted shots were disappointing. Scenes of Gizmo walking down the street were among the most successful in the film. "We used a Topo-Gizmo for that shot," Baker related, "so the puppeteer working the legs had to be as close to the puppet as possible — which caused problems for bluescreen. Using Apogee's *Blue Max* front projection bluescreen process, we were able to puppeteer a little bluescreen shield right behind the puppet, which allowed them to get a pretty good matte. We hoped we could put the mini-bluescreen right on the puppeteer's arm; but the screen had to be kept parallel to the lens of the camera, so we ended up having another person puppeteer it. It was a hard thing to do because it was such a long run and Gizmo had such short little legs, but we got an interesting looking run which was kind of cute."

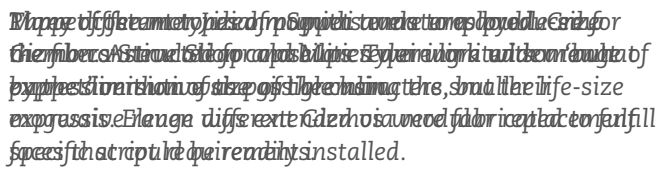
The process of building the gremlins was basically the same as that for building the mogwais — once the designs were finalized, the sculpting began, and then the designs were refined further as the characters came to life in three dimensions. Each gremlin was conceived to resemble the distinctive mogwai character from which it sprang — consequently, the Daffy gremlin had eyes that went in different directions, while *George*'s thick lips and pugnacious expression remained his most distinctive qualities. Perhaps the most radical design change was giving the Mohawk gremlin lizardlike spines. "I didn't want Mohawk to have a furry comb like Stripe had in *Gremlins,*" said Baker. "I just didn't buy a lizard with fur. I said, 'Let's give him a fin,' and so all the Mohawk puppets had a fin that opened up."

The gremlins were never sculpted and cast in one piece. Instead, they were divided up into overlapping pieces the way Baker does his prosthetic makeups. "The arms, for example, ended at the shoulder and were blended onto the chest, and the hands usually didn't have fingers on them — the fingers were separate appliance pieces that were easier to cast out of different materials. The heads were blended onto the torso, as were the legs. We made six or eight versions of each gremlin — virtually the same array as the mogwais — and we built a variety of different armatures for each character. Usually there was a 'butt puppet' — where the puppeteer's arm went up the rear end of the character — which had arm rods out the elbows and a simple eye-blink mechanism. We also made some with positionable arms whose joints could be loosened up and tightened down. There were also some stunt gremlins we could toss around, some closeup versions with fully articulated radio-controlled faces, and we had a telemetry suit for most characters."



A telemetry suit is comprised of sensors attached to a puppeteer's body which translate his movements to the puppet via radio control or cables, thus allowing the puppet to duplicate with fair precision the operator's movements. In the case of *Gremlins 2*, a telemetry system was built to control each character's upper body, while the gremlins' legs were

puppeteered separately via rods. “Telemetry systems are more or less standard,” said Baker, “but the unusual thing about these was they worked! They worked a lot better than anything I’d ever seen — and I’ve been playing around with this technology for a long time. I’m still frightened enough of them not to use them too much, because there are too many things that can go wrong.”



Many different types of puppets were employed for the film. Stunt dolls for the Mogwai fight scene, hand puppets for close-up dialogue, and telemetry puppets for shots of the gremlins’ faces. Here, a telemetry puppet is shown with its head and upper body covered in rubber skin. Below, a telemetry puppet is shown with its rubber skin removed, revealing the mechanisms that control its facial expressions.

To ensure that as little went wrong as possible, Baker had his mechanical team build a preliminary version of the telemetry system for a ‘Rick Baker test.’ “I think part of my job is to play with this stuff and break it,” Baker explained. “I hate going on set when everyone’s ready to shoot and have something that doesn’t work. So during the R-and-D period, I like to really tear into things and see what’s likely to go wrong. A lot of times my guys will make a mechanism that has to be operated really gingerly, but I handle it like some moron who doesn’t know how to work it. Often technology inhibits you more than it helps. I had a good group of people in the mechanical department, but what I run into on every show — unless I do the mechanics myself — is that the guys will make these great looking mechanisms, but when we cover them up they don’t move the rubber. Then they’ll say: ‘It worked fine before you put the rubber on it. You have to make the rubber softer.’ And I’ll say, ‘No, you’re building a mechanism to move the rubber — you’re not building a pretty part.’ Dave Kindlon did the arm mechanisms, and I told him they had to be really good, because I knew once we covered them in rubber, if a cable slipped off a pulley or broke, it would mean we’d have to cut the rubber skin off to get inside to fix it — and I didn’t want to have to do that. Every night before I went home, I would play with those arm mechanisms, and when Dave would come in the next morning, I’d say: ‘Look, this cable broke. We have to remake it so it won’t happen again.’”

Unlike the mogwais, the gremlins were large enough that they did not require double-size versions to accommodate the mechanics. “The regular heads were big enough because I made our gremlins larger than the ones Chris had made for the first film,” Baker stated. “We used the same sized heads for the telemetry puppets as we did for our fully articulated heads — we just put more mechanisms into the closeup versions. The fully articulated heads had servo operated faces, with a full range of lip and eye movement. Their jaws opened and closed, moved forward and back and side to side, and their ears worked. Some of them had squint, some smiled and some frowned, depending on the character. It was basically a question of space, but not every expression was appropriate for every character.”

In the spirit of simpler is better — and less time consuming — background gremlins were built with decreasing levels of articulation. “There were only two different background gremlins,” Baker noted. “One was called ‘Matt’ because Matt Rose sculpted him and the other was called ‘Steve’ because it was sculpted by Steve Wang. We literally made dozens of different colored Matts and Steves. Matt was very close to my original concept paintings, while Steve was slightly different. We didn’t even bother to clean the seams up very much on our way-in-the-background gremlins, and they had quick paint jobs. Our middle background ones had pretty nice paint jobs, their seams were cleaned up and they looked pretty good, but they had no eye mechanisms — the mouths just opened and closed.”

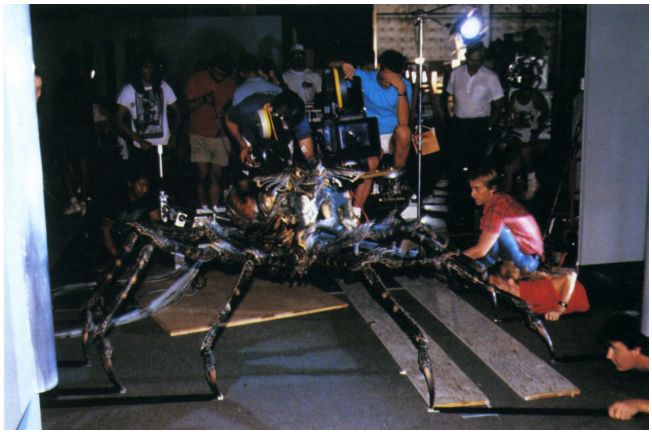
In the course of the film, the gremlins run amuck in a genetics lab — a sequence which afforded Baker and company the opportunity to run equally amuck with outrageous mutations. Among the more fanciful creations was a female gremlin with passionate desires for a corporate snoop played by Dante regular *Robert* Picardo. "In the first movie," Baker observed, "the closest they came to creating the female of the species was to dress regular gremlins up like girls. I thought it'd be much neater if we really made a girl gremlin, gave her heavy eyelids with lashes, full lips, curves and stuff, and I wanted her feet to go right into these big high heels. We ended up building three different girl gremlins. One had lips that puckered, another had eyes that fluttered really fast and the final one was more of a normal butt puppet. There was also a complete dummy which we attached to Bob Picardo's leg. Bob did a great job puppeteering that dummy — he really got into it."

Though all concerned had agreed that the gremlins would invade the genetics lab and mutate after drinking various concoctions, no one was sure exactly what the gremlins would become. Finally it was decided that there would be a vegetable gremlin, a bat gremlin, a spider gremlin and a brain gremlin.

The key feature of the vegetable gremlin was the sudden appearance of various types of produce popping out of its head. "We weren't quite sure how we were going to do that effect at first," Baker admitted, "but we ended up doing it with bladders. Norman Cabrera made these little fruit and vegetable bladders, painted them, and then shoved them down into slits we cut into the skin of one of our regular puppets. The bladders worked off a squeeze bulb that put so much air into them so fast they just popped out. You only see a few of them actually do that. Then they cut away. When they cut back, we had stuck appliances on the puppet. Unfortunately, I don't think his changing ears registered with too many people. Ed Yang built an effect to transform his ears into lettucy-looking things using a vacuum to suck his regular gremlin ears down onto a veiny form inside — but the change was done too subtly. When they cut back after that, we went to the actual sculpted vegetable gremlin puppet."

The film reaches a frenetic highpoint when the gremlins invade a genetics lab and begin swallowing experimental potions that alter them physically. One becomes a bat gremlin and flies out of the building. To impart a convincing sense of flight, a telemetry rig was developed so that flapping movements made by the puppeteers would translate directly to the puppet. Suspended from a crane, Tom Hester and Tim Lawrence operate the rig while a remote camera records the action.

For the bat gremlin, Baker thought he would save some time by adapting one of the prototype gremlins made by Tom Hester during preproduction. "We decided the bat gremlin should start out as a smaller, different-looking gremlin," Baker recalled, "so we changed the arms on our prototype to put wings on him and added some appliances to alter his face a bit. As it turned out, it probably would've been easier to start from scratch because it was a lot of work to do all of the appliances needed to make this old puppet into the new one." Hester built three different bat gremlins, including a full telemetry suit version. "Besides the flying one, there was a stunt version and a hand puppet version. The flying bat was actually pretty neat. We built a huge telemetry rig so puppeteers could operate his legs, but the wings were operated by rods that came off the arms."



A spider gremlin is made to walk by eight puppeteers jockeying rods attached to its claws.

One hundred fifty puppeteers — each operating two characters — were needed for a scene in which an army of raucous gremlins packs the lobby of a giant skyscraper from wall to wall. Optical split-screens were employed to make the three hundred gremlins seem like many times more.

Baker relied on this telemetry suit version and the stop-motion talents of Doug Beswick to make the bat gremlin take flight. "I thought Doug's stop-motion puppet matched ours very well — as did his spider gremlin. In both cases, we did our puppets first. Doug used ours to make his own stop-motion puppets, and then we painted them to match. The sequence where the wings grow out of the gremlin's back was done by Doug, but the puppet in the foreground was ours. The flying scenes where you saw the entire bat were also his work; but there were quite a few flying shots where you see most of the creature, and that was our telemetry suit bat."

The bat gremlin's principal scene took place out on the street where it attacks Murray Futterman — another Dante regular, Dick Miller — and the two tussle about in some wet cement being poured on the sidewalk. "First Dick Miller grabbed our flying puppet and held onto it. Next he was seen throwing the stunt puppet in the cement. Then we cut to our hand puppet thrashing around in this simulated cement — which was actually acoustical ceiling material. The shot was done on the New York street at Warners. The production dug a pit with a big trough to put the cement in and Tom Hester was underneath puppeteering. The cement was messy, and it was a pretty uncomfortable position for him since his arm was sealed up in this trough so the cement wouldn't leak through."

When Joe Dante suggested that Mohawk transform into a giant spider gremlin, Baker countered with a proposal that he become a centaur-spider — part gremlin, part spider. When Dante agreed immediately, Baker should have explained to the director that such creatures are best handled

using stop-motion. “I always envisioned it being done entirely as stop-motion — which works great for certain things like insects — and I figured that would be one less puppet we would have to build. Then during one of our late-in-the-game storyboard meetings — after I’d figured the spider gremlin was off our list — Joe told me he wanted to see our spider on the set. I said,‘What do you mean Joe, that’s going to be stop-motion.’ ‘No, I’ve got to have something there.’ So we built this pretty neat puppet. Steve Wang did most of the work on it and created the paint scheme. It was really a beautiful thing to look at. The upper torso was made from one of our Mohawk puppets that had a pole arm coming out of its butt — which made it relatively easy to puppeteer. The problem was the legs. I figured we’d have several puppeteers under the set, and each one would operate a leg; but when we went to see the set a couple of days before we were going to shoot, we learned it had been built on the floor. I went, ‘Wait a minute, I thought we talked about this being a raised set.’ They said, ‘You always want raised sets.’ I said, ‘This is a fucking puppet movie! We’ve got to be under this stuff to operate it.’ They said, ‘Well, we can’t raise the set now — it’s built. You’re just going to have to deal with it.’ To do that, we ended up making little rod extensions that came sideways off the bottom of the legs. Our puppeteers had to operate the spider gremlin while laying on the ground, then hand the leg rods to the next puppeteer in line as it moved through the set. It was like runners passing a baton.”

When Dante decided that the spider gremlin would meet a fiery end, Baker and crew resigned themselves to the fact that their beautiful puppet would be destroyed — but at least its glorious demise would be recorded for eternity on celluloid. “The fire department wouldn’t let us shoot it on stage because the puppet was made of polyurethane foam which creates cyanide gas as it burns. So the set had to be rebuilt outdoors. This time, it was an elevated set so our puppeteers could lie beneath it — it would’ve been pretty difficult for them to lie on the floor with a burning puppet dripping down on them. After we did all the shots leading up to the burning, the grips set up four cameras on the puppet as the studio effects guys came in and painted rubber cement all over it. One of my guys who was watching them said: ‘Don’t you think you’re putting too much rubber cement on there? We want to see this as it’s burning.’ And they said: ‘We’ve been doing this for thirty years. So you just shut up, play with your puppets and we’ll take care of this manly effects stuff!’ We had something like twenty puppeteers there to operate this thing, and we had worked out what we were going to do with his face and his hands, how he was going to scream in response to being on fire and so on. But when they got all the cameras rolling, someone put a match to it and sixty feet of flames went shooting straight up. Nobody expected that. We thought we were going to see the puppet burn and instead it just went ‘whoosh’! At dailies the next day, we learned that every camera just went white — you couldn’t see anything. Joe asked, ‘What’re we going to do?’ I said, ‘I guess we’re going to make another puppet.’ We took our other pole arm version of Mohawk — which had a full pair of legs — made a new spider back for him and burned it again.”

Of all the puppets constructed for *Gremlins 2*, none was more challenging or complex than the brain gremlin gifted with the power of extraordinarily fast speech. Effecting lip sync in puppets is difficult at best, and Baker realized that keeping up with the rapid-fire dialogue — spoken by Tony Randall — was going to be a major undertaking. One of the problems was the puppet itself. As originally conceived, it was Lenny, the stupid gremlin, who was going to drink the brain formula and become intelligent. With that in mind, Lenny’s lips were designed to be able to form correct word shapes.

Unfortunately, a different gremlin altogether was chosen for the part. “At the last minute, Joe decided he didn’t like the idea of the stupid guy getting smart, so our regular garden variety gremlin became the brain gremlin. The problem was his lips weren’t designed to talk. He had a wider, more reptilian mouth which could not form words as easily as Lenny’s; but he did a pretty fair job, considering.”

Creating a system to control the complex servo mechanisms required to give the brain gremlin articulated speech was the next headache. Baker considered using a facial telemetry system, but when he realized that the operator would have to move his own mouth in perfect sync with Tony Randall’s prerecorded dialogue, he decided not to leave so much to chance. The only foolproof approach was to employ a motion control system capable of recording the manually performed servo commands needed to produce precise lip sync and then play them back on command. After several less-than-successful attempts to develop a system in-house, Baker selected the Gilderfluke system designed originally to record and play back complex light cues for rock concerts. “Using the Gilderfluke system, we could program our puppet’s movements at half speed and play them back at full speed using SMPTE time code on the audio track that worked with the computer. The computer system made our puppet’s moves completely repeatable, so the brain gremlin was able to make the same lip movement every single time.” Mark Setrakian, who had built the brain gremlin’s mechanisms, was tasked also with programming the lip movements. “The results were fun to watch. When we turned it on, the puppet would start talking a mile a minute — and every word was in sync. Even his tongue was synchronized with his mouth movement.”

Assembled in the Rick Baker workshop — which had to be doubled in size to accommodate the demands of the film — are most of the mogwai and gremlin characters created for Gremlins 2. A crew of seventy-five makeup artisans toiled on the project for nearly two years.

While the brain gremlin’s lips were preprogrammed, the rest of his movements were puppeteered live. “When he sings ‘New York, New York’ at the end, his lips were the only part of him that was programmed,” said Baker, “so I was concerned about having a core group of talented puppeteers on this film — but I really had to fight to get them. From the beginning, I told the studio I wanted Screen Actors Guild puppeteers because our puppets were characters in the movie and I wanted them to be able to give a performance. The studio guys said: ‘That’s bullshit, your puppets are props. It’s a Local 44 special effect and special effects guys should operate them.’ Warner Brothers was really pissed at me because I basically said either we do it my way or I’m not going to do it. As it turned out, all of the puppeteers for our main characters were people I’d worked with before —

people like Steve Sleap, Tim Lawrence, Mark Wilson, Tom Hester and Marc Tyler — and I think the studio understands now why I wanted them. We got much more of a performance out of our puppets than they did in the first film."

Baker ended up codirecting his puppets along with Dante and the puppeteers themselves. "It was a real group effort. Usually Joe would have a vague idea of what he wanted. I'd talk to the puppeteers about it; then they'd do something, and Joe and I would make suggestions. I like to operate the stuff myself — it makes the day go faster and it's fun — but there was so much to pay attention to that my main job during the shooting was to watch the performances and communicate with the puppeteers and with Joe."

Although the principal puppet characters photographed in closeup were the most demanding in terms of construction and performance, the climax of the film afforded a unique opportunity for the puppet crew to make a mere three hundred gremlins look like thousands. With retired matte master Albert Whitlock on hand as visual effects consultant the entire lobby of the tower building was filled wall-to-wall with gremlins. "The biggest shot was a split-screen master with about eight passes on our puppets," Baker recalled. "Although this type of shot had been done in the first film for the movie theater sequence, I was concerned about it because in that case they had been able to use the theater seats to hide their puppeteers. On this film, there was nothing to hide our puppeteers with but the puppets. We realized that to make the shot work, we had to pack our puppets so close together that the audience wouldn't see anything of the operators."

To maximize the number of puppets in the frame, the visual effects team divided the lobby set into eight sections, filled a section at a time with puppeteers and gremlins, then shot each section separately using a locked-off camera. "The set crew removed the floor sections of the lobby, which allowed us to fit our one hundred fifty puppeteers beneath the first section of the set. They were completely hidden from camera by the three hundred puppets they were operating. Once that section was photographed, the visual effects crew roped it off and moved everybody over to the second section. Then we changed the puppets' clothes — like it really mattered! — and they shot our puppets in the next section. We did that six or eight different times, but it went really fast. The camera was locked off and the scene was prelit, so it was really only a matter of getting our puppeteers in the right place so the effects crew could roll a few seconds of film and that was it. They shot all the pieces and did the composite later where they added another pass with balloons and confetti to hide the seams."

After two decades in the business, Rick Baker has ample perspective from which to reflect upon the makeup effects field and his place within it. "When I first started out, I did most of my work in my bedroom or in my garage. When An *American Werewolf in London* came along and I opened my own shop with a crew of six, I remember thinking that there had never been a time like this where producers were willing to spend so much money to make monsters — $300,000 to do a werewolf was unheard of, and I had the time to do the job right. But I didn't think it would last. I expected it all to die out after a couple of years and I'd be back working alone out of my garage. I thought the best I could ever do would be to work out of my house like Dick Smith did, or to work at Universal in the lab. In fact, it was my fantasy when I was a kid that I would grow up to be like Jack Pierce — the guy who did *Frankenstein* and *The Wolf Man* and all those great old movies at Universal — and I'd be

able to make all this rubber stuff and it'd be great. Now I'm quite happy not to be like Jack Pierce. Jack Pierce died poor and unappreciated. As a kid, I wished I'd been born earlier so I could've done all the 'B' monster movies in the fifties — but now I thank God I wasn't. Paul Blaisdell, the guy who made most of those monsters, was lucky to get paid for his work and he had no time in which to do it. I make very good money and I'm given the time to do good work. I never dreamed it would be like this. I'm blessed to have come along when I did and I've had a lot of lucky breaks; but I've also worked hard to get where I'm at, and I think I've done it off my ability."

Still, success has its downside — and for Rick Baker, that downside has meant having to relinquish some of his hands-on involvement and perhaps pass on an appealing small project incapable of supporting his overhead. "I didn't get into this business to be a figurehead type guy," Baker remarked, "but I have to admit, to be honest, that I don't get the same thrill out of sitting down and sculpting that I used to. After you've done it for twenty years of your life, it's not as exciting as it used to be. I've done almost everything I can think of with makeup, and the repetition of it is starting to become just that — repetitious. I can't imagine not doing something creative with my life, but that's not all my life's about these days. The unfortunate thing is that I make a lot of money at what I do, but it costs me a lot of money to support my shop — especially during the months between assignments — and I can't always afford to take on the smaller jobs I'd like to do. I see myself at some point in the future not having a big shop, but working in a smaller place where I could design and consult and make stuff, and do the kinds of things I would really like to do."

Might that include branching out into directing as some of his makeup contemporaries like Stan Winston and Chris Walas have done? "No, I don't think so," Baker smiled. "I'm content making monsters."

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THROUGH THE PROSCENIUM ARCH

article by
Janine Pourroy

Walt Disney knew what he was doing back in 1955. In conjuring a magic kingdom out of southern California clay, he established a precedent in amusement park entertainment that was to stand unchallenged for years. With brilliant insight into the American psyche and unerringly shrewd business acumen, Disney breathed life into his now-famous Disneyland and altered forever the course of amusement park history. Rattle-and-shake roller coasters perched atop great heaps of trestle were eschewed for the sleek lines of bobsleds coursing through a Matterhorn-style mountain. Garish and groaning carnival rides were rejected in favor of magically spinning teacups straight out of Wonderland. Splendid trains — fashioned precisely after turn-of-the-century steam engines — chugged around the park, while a state-of-the-art monorail system flowed along its elevated futuristic track. Disneyland was a class act in every regard — from the charmingly nostalgic Main Street that greeted guests as they entered to the impeccable transformation of successful Disney films into clever and entertaining rides.

Disney also had the foresight to envision his land as an expanding, changing entity. As public tastes became more sophisticated and technology burgeoned, so did the Magic Kingdom. The park not only grew in size — gaining such attractions as 'Pirates of the Caribbean,' 'The Haunted Mansion' and 'Space Mountain' — it grew in dazzle. By the early eighties, the time was ripe for yet another feat of amusement park derring-do, and the Disney company began developing what was to become one of its most popular attractions to date — 'Star Tours.'

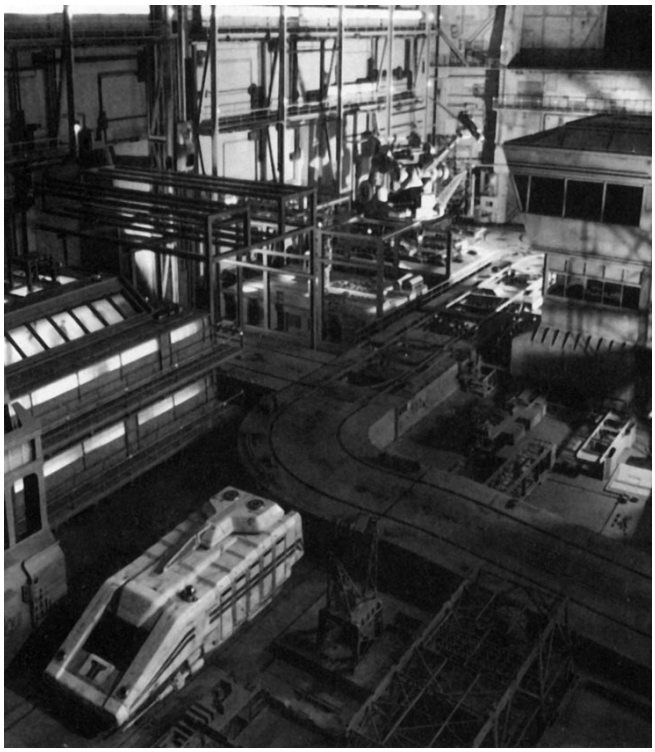
Walt Disney built an empire by successfully marrying film with real-life fun. Countless attractions and dozens of the costurned characters that wander the park were first born on the silver screen. The creation of an attraction that actually employed film as *part* of the ride experience — while basing it on a proven phenomenon such as the *Star Wars* trilogy — was perhaps the next logical step. 'Star Tours' began as a collaboration between the creative minds at Walt Disney Imagineering — known as WED Enterprises until 1986 — and George Lucas' *Industrial Light and Magic*. Disney was interested in using flight simulator technology in combination with first-rate screen images to create a new ride experience and wanted ILM to provide the film footage.

“The ‘Star Tours’ project was pretty interesting,” commented ILM effects supervisor Dennis Muren. “Other people had been working on simulator rides for years, and I had really never had much of an interest. But the idea of doing a four-minute film with no cuts was intriguing. We had to plan it not only in terms of what you were going to see, but how your stomach was going to react. We had to plan for that element just as we would plan other films for cutting and for the way motions are within the frame. With this, we also had another level of planning — how we wanted the audience to respond to the sweeps, the ups and the downs. All that had to be written into the script; because it was no longer simply a matter of trying to tell a story — there was a new level of communication that needed to be used as carefully as a cut or a model design or the plot. We couldn’t just move the simulator platform all over the place — it really needed to be done with a lot of thought. When it worked it was almost like adding a 3-D level to the experience.”

Rediffusion Motion Platforms — an English manufacturer of flight simulators used to train both commercial and military pilots — was contracted to provide the hydraulic simulator platforms for ‘Star Tours.’ ILM art director Dave Carson was asked to storyboard the film and flew to England to ride the simulator in preparation for the task. “Riding the simulator gave me a sense of its limitations and capabilities so they could be incorporated into the storyboarding of the ride. The simulator platform had been set up with a minimal kind of personal computer interface — as opposed to a full-fledged flight simulator which would have involved hugely expensive computer graphics simulation equipment. A couple of seats were set up along with a small projection television running some videotape of a motorcycle point-of-view of a motorcycle race, as well as a small airplane flying around and a roller coaster ride. They ran that tape for us with the platform programmed to match, and it was very impressive — particularly the feeling of acceleration. The effect was surprisingly convincing, even with the really poor visuals and sound. To get a sense of its ‘zero-G’ effect, I asked them to drop the simulator platform as fast as they could. That turned out to be one of its limitations — the platform couldn’t drop very fast. But everything else we asked it to do, it did beautifully. It seemed to me there were very few limitations that had to be borne in mind. I did find that the visuals were really important. We rode it a couple of times without looking at the tape; and as crude as the tape was, without a visual you really couldn’t tell what you were doing.”

The original concept for ‘Star Tours’ had been reminiscent of a ride developed by cinematic innovator Douglas Trumbull and his Future General Corporation in conjunction with Paramount Pictures in the mid-seventies. It was called ‘Tour of the Universe,’ and using film and a simulator conveyed a realistic, scientific venture into outer space. Trumbull had long been intrigued with dark rides — the sort of ride wherein a passenger conveyance is moved through a darkened course lined with images of unanticipated action. He maintained that unwieldy visual material — such as a fire breaking out or gallons of water being poured toward passing vehicles — could be incorporated into a dark ride via film imagery. A prototype ride using the unnervingly realistic Showscan process was developed by Future General in the mid-seventies. In it, a screen hunchback throwing a rock through an overhead window was paired with the sound of breaking glass from speakers below the passenger vehicle. The convincing effect left ride-goers wondering how the operators managed to sweep up broken glass all day long. The conservative theme park industry, however, was not yet ready to adopt such nontraditional fare. ‘Tour of the Universe’ was the next generation ride. Like its successor, ‘Star Tours,’ it utilized the nontraveling Rediffusion Motion Platform. And while it was

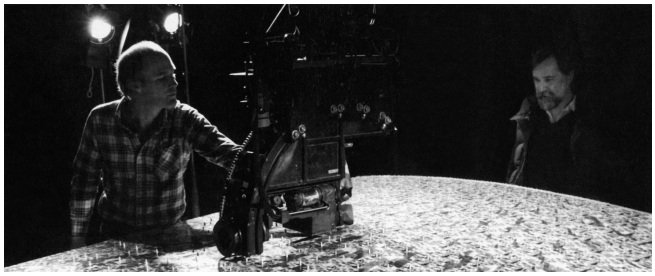
very well received within the theme park industry, it too failed to find a permanent home within that milieu.



Among the first simulator rides to be widely experienced was 'Star Tours' — a collaborative effort of the Walt Disney and George Lucas organizations installed at Disney theme parks in the late eighties. Point-of-view film footage produced at Industrial Light and Magic is projected onto a viewscreen in a forty-passenger shuttle hydraulically actuated to impart the sensation that the craft is physically moving. The ride begins when a robot pilot takes an unscheduled detour through the launch station — actually a miniature set — and out into space for a battle with imperial forces straight out of Star Wars.

Model shop supervisor Steve Gawley attends to last-minute detailing of the shuttle station.

Years later, ILM and Disney would collaborate on paring down a similar storyline into something that would be manageable within the time frame determined for 'Star Tours.' The basic notion of the ride has a futuristic travel agency — called 'Star Tours,' of course — booking trips to various mythic locations familiar to *Star Wars* devotees. Adventurous travelers are offered dream vacations to their favorite planetary locales — Hoth and Endor are among the possible destinations. The problem — and premise of the attraction — arises when a rookie robot commandeers the shuttle and gives its unwitting passengers a runaway ride through space.



Effects cameraman Scott Farrar and assistant Robert Hill program a low-level motion control pass over the Death Star. A principal challenge of the medium is the need to design a sustained film adventure with no apparent cuts.

As storyboard artist for the ride, the biggest challenge for Dave Carson was in plotting a narrative that had no cuts. "It was quite a different process from what I was used to. We were playing the whole thing as one continuous four-and-a-half-minute adventure where we had to go to a number of different places sequentially, without cuts to closeups. The jump to hyperspace helped a couple of times getting from one event to another, but I discovered that what really helped was boarding in a lot of turns. Making a bank, I would play a piece of action similar to the way I would play it for a film; and then when the next event was supposed to happen, there would be a turn or a fall or something so I could point the craft in a direction you hadn't seen up until then. That would take us to the next piece of business. Once I learned to use that technique, it was a pretty straightforward matter of just laying it out much as you would for a film."

The ride footage was produced at ILM in northern California while the simulator platform was programmed at the Disney facility in southern California. To help coordinate the separately-produced visuals with the actual motion of the ride, ILM made a full-length videomatic of the film. "Once the storyboards were done," continued Carson, "the first thing we did was make a video of the ride. About half of it was done using cardboard cutouts and hand-operated cameras, and the other half was done using simple wire-frame computer graphics. The combination of those two was cut together into one piece of videotape that represented roughly what the ride was going to do and look like. That was sent down to Disney and used as a kind of template. That way, they could begin programming the simulator based on the videotape and we could begin laying out the actual models, the size of the models we would need, the speed of the camera through the sets, and so on. Disney eventually received a simulator from England, and we were then able to refine things a bit. For example, they would program to the tape and learn certain things about motion that were awkward for them — or certain things about motion that they would like to see a little more of. We could then go down and ride the simulator and get their input. In turn, we might make some suggestions — it was give and take. We were constantly updating the video. Whenever we got a piece of the film in a rough version, we would drop that in so that gradually the tape they were using as a guide grew closer and closer to the finished product."

The ultimate result was a ride utilizing four simultaneously running, forty-passenger simulator platforms. One of the most popular attractions at Disneyland, 'Star Tours' has spawned a second,

identical simulator ride at Walt Disney World in Florida, as well as a related ride experience, 'Body Wars.' 'Body Wars' is also founded on the fundamental Disney belief that good movies — in this case, *Innerspace* — should go to theme park heaven when they close. The premise of 'Body Wars' is that ride-goers can buy tickets to tour inside the human body. Passengers entering a craft are 'miniaturized' and injected under the skin of a volunteer. There they are treated to an *Innerspace*-style panorama of blood vessels, fat cells and hair follicles — film imagery again provided by ILM. Suddenly it becomes evident that there is a problem — an infected splinter has drawn the attention of some ominous-looking macrophages. A doctor, who happens to be on board, dons scuba gear and leaves the craft to investigate. Outside, she is knocked for a loop by an errant piece of splinter and drawn into a blood vessel. Naturally she must be rescued, and her fellow passengers follow in hot pursuit.

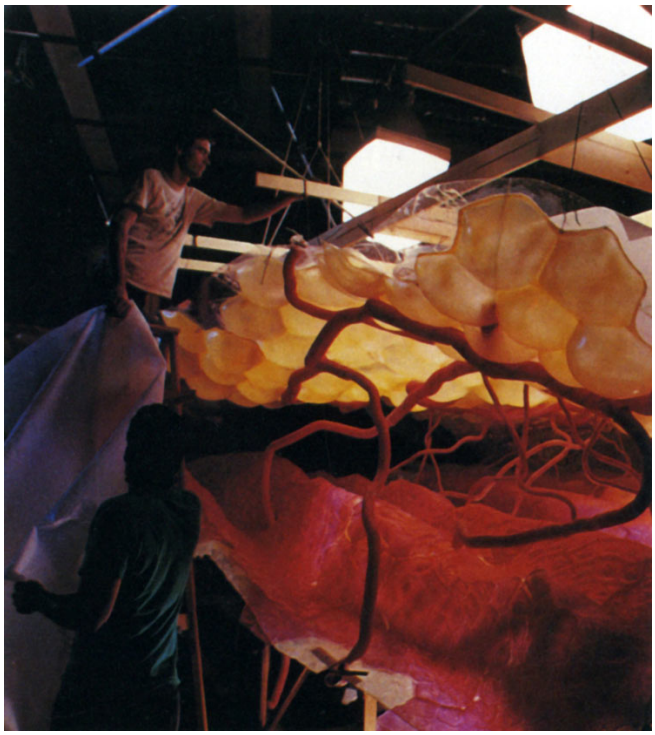
The technology involved in marrying film imagery with hydraulic motion has expanded considerably since Douglas Trumbull first came up with 'Tour of the Universe.' The arena has opened into a new frontier of opportunity for cinematic ingenuity — and an outlet for the kind of vision not necessarily embraced by the more staid film industry. Universal Studios, known for transforming the storylines of popular motion pictures into attractions at their studio tours in California and Florida, has recently taken the plunge with its new 'Back to the Future' simulator ride.

Universal was determined to depart from the now-routine method of placing a windowlike movie screen linked to a 70mm film projection in front of an audience seated in theater-style rows on a simulator platform. In a bold departure from this proven format, it was decided to create the 'Back to the Future' ride with the audience seated in eight-passenger 'DeLorean' cars placed atop flight simulator platforms within a seven-story-high Omnimax surround screen. As with the IMAX format, Omnimax employs 70mm film run horizontally through the camera and projector at twenty-four frames per second. The significant difference between IMAX and Omnimax, however, is that while IMAX is projected onto a flat screen, Omnimax is shot with a fisheye lens and projected into a hemispherical screen, something like a planetarium. The challenges inherent in shooting a special effects film with this kind of technology were enormous. After a couple of false starts, Universal approached Douglas Trumbull and his Berkshire Ridefilm Corporation, located in a renovated Civil War-era textiles mill in the spectacular Berkshire mountains in western Massachusetts.

Known within the industry for his innovation and tenacious determination to push existing technology to its limits, Trumbull accepted the challenge. Though his reputation was built as a visual effects creator on such landmark films as *2001: A Space Odyssey, Close Encounters of the Third Kind* and *Blade Runner* — also as the director of *Silen Running* and *Brainstorm* — Trumbull had long been interested in developing simulation entertainment. "To me, movies have always been a technological form of entertainment. It takes lights and cameras and lots of very technical media to make a film. It's not like the theatrical stage or making a record. Unfortunately, it's a technological medium that's almost unused these days. The movie medium as we know it is controlled almost entirely by agents and businessmen who are basically trying to sell a product and market it. The issue is not cinema, but who is the director and who is the actor. How do you get Tom Cruise and Dustin Hoffman in a movie together? That's not cinema. It's using film and telling a very interesting

story — I don't mean to deprecate it — but it's just not pushing the edge of what cinema can be. In my opinion, cinema as an art form peaked out in the 1940s. And aside from a few special effects movies, which are always trying to do something unusual, the medium itself hasn't changed."

'Body Wars' utilizes the same technology as 'Star Tours,' but takes ride-goers on a subcutaneous adventure patterned after Innerspace. Currently at Walt Disney World only, the ride employs film footage — again provided by Industrial Light and Magic — to simulate a perilous organic passage through the human body.



Stage technicians Joe Fulmer and Mike Olague ready one of the innerbody sets.

Universal's commitment to the ride project got Trumbull's attention. Despite some initial misgivings about dealing with the problem-ridden Omnimax format, he accepted the opportunity to once again take the cinematic medium to the limit. The first task was to create a storyline that would work well within the Omnimax venue.

Early in the ride, a splinter punctures the host's skin and a doctor on board the craft dons scuba gear and goes out to investigate. To produce the footage, an actress was photographed against bluescreen and composited into the macroscopic simulation.

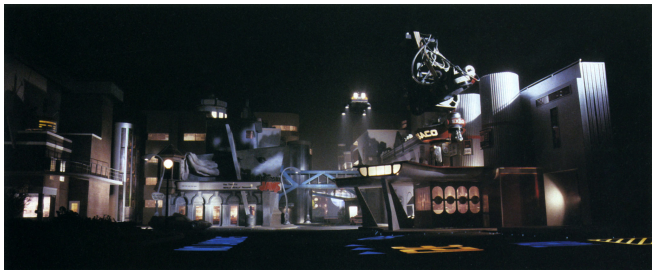
By nature, the Omnimax format precluded traditional lighting techniques and set design. Additionally, there was no suitable Omnimax optical printer at the outset of the project — a situation that inspired the decision to generate as many shots as possible in-camera. Therefore, the storyline was designed to facilitate the format. The resulting ride begins with an elaborate preshow produced by ZM Productions. Passengers become aware of the impending experience almost immediately upon entering the ride building. A system of security-style video monitors — strategically placed for viewing as people wait in line — informs the crowd that Doc Brown is frantically working in a secret lab somewhere in the building while Hill Valley's resident troublemaker, Biff Tannen, is tearing through another section of the building in a rampage. Biff ultimately eludes security guards and steals a time-traveling DeLorean from Doc Brown's laboratory. With the good doctor communicating by closed-circuit monitor, ride-goers are entreated to catch Biff and stop him before too much interdimensional havoc has been wrought. The ride-goer then boards the only other DeLorean time machine in the whole world — actually there are eleven more arranged carefully out of each others' view within the Omnimax dome — and embarks on a thrilling, high-speed chase through an assortment of times and places.

The ride visuals begin with Biff's car speeding into an eighty-eight-mile-per-hour 'time ver' — 'ver' being coined from the 'varoom' sound accompanying the passage through time — and entering the Hill Valley of the future. After a near collision with an oncoming truck and other assorted close calls, Biff escapes through another time ver while soaring neatly over the town

square clock tower. His pursuers, however, crash *into* the clock and tumble through time along with bits and pieces of the famous landmark. Both vehicles enter the ice age, and an almost serenely beautiful setting is revealed. Biff stirs things up by darting in and out of icy crevasses, causing chunks of snow and ice to break away and tumble toward his pursuers. Biff escapes through time once again, while his followers — having lost engine power — tumble rapidly toward an icy river. With only seconds to spare, the free-fall vehicle reaches eighty-eight-miles-per-hour and a time ver is entered in reverse. Still in prehistory, Biff is followed up and over the rim of a smoldering volcano and into a forest of cinder pyres inhabited by a pair of tyrannosaurs. Biff manages to infuriate one of them before losing power in his flux capacitor. His pursuers zoom straight into the beast's open mouth. After being chomped around a bit, their vehicle is spat out and into a lava falls along with Biff's DeLorean. Fortunately, passage over the falls forces the cars to touch, therefore making it possible for both vehicles to escape through time together. The cars reenter the present by smashing through the 'Back to the Future' sign on the ride building and landing on a pad where four technicians rush out to arrest Biff.

One of the first preproduction decisions was to eliminate live-action — except for the preshow — and accomplish all ride visuals strictly with miniatures and other effects. “It was clear that we had to go with special effects all the way because of the Omnimax fisheye lens,” explained Trumbull. “In a regular movie, a fairly normal focal length lens is used. It looks out about thirty or forty-five degrees wide. Then all around the camera are the lights and flags and stands and other paraphernalia used to light that shot. But when you’re shooting with a fisheye lens, it sees 180 degrees wide straight up into the ceiling and down into the floor — so where do you put the lights? It was the most fundamental problem of the whole show. All preceding Omnimax movies had been exterior, live-action travelogues. They had to be very carefully lit because if the lights were behind, then the shadow of the camera would be in the shot; and if the lights were in front, then the lighting source itself would be in the shot. There was really no place to put the light except for a very narrow band out to the side, about five degrees wide. Obviously, we had to come up with methods to light our entire show without ever having lights in the shot. So we actually designed the show backwards, conceptually, from the problem to the solution.”

The problems of lighting and designing the miniature sets were tackled during the conceptualization process. “Another of the requirements of Omnimax,” explained photographic effects supervisor Susan Sitnek, “is that you can’t have very much light on anything because of cross-reflectance — which means that when you have very light scenes, the light from one side of the dome reflects and bounces around inside the dome and washes out the image on the other side. So all of our scenes were shot with dark backgrounds and strong light-and-dark effects. That way there were some hot areas and bright lights; but no large sections on the screen — except in rare, quick instances — were ever covered by big washes of light. That meant that our colors stayed saturated and we got a lot of contrast — which was very striking. Also, because of the constraints of the fisheye lens, most of the lighting in the show had to be built into the set. It had to be practical or appear to be practical. So the lighting design was integral to the set design.”



The latest simulator ride attraction — derived from the Back to the Future trilogy — debuted recently at the Universal Studios Tour in Florida. In a departure from the Disney formula, the ride takes place in a domed environment where the Omnimax film imagery — produced by Douglas Trumbull at his Berkshire Ridefilm Corporation — encompasses the participant’s full range of vision.

The Hill Valley set posed the greatest design challenges. “Hill Valley had to be planned literally move by move,” explained production designer Robert Taylor. “Because of the problems of Omnimax and the problems of the shooting stage, we decided to build a quarter-scale miniature of the model itself based on the storyboards. We put one together out of foam plastic, straws, cardboard and other crude materials, and also made a miniature crane and camera. Then we tracked the whole thing and altered the model to accommodate what the camera could do, so that before we even built anything we would know exactly what we were in for. Otherwise, we might build some elaborate set and then find out the camera couldn’t shoot it. As we went along, we altered our storyboards to fit what the model showed us could be done.”

Special effects supervisor Hirotsugi Aoki tends to details on a twelfth-scale model set representing Hill Valley in the future.

The Hill Valley of the future was designed as if envisioned by someone from the Hill Valley of the past — a sort of futuristic fifties look. And because towns and buildings have a tendency to be made up primarily of straight lines and angles — geometry thrown for a loop by Omnimax’s fisheye lens — the decision was made to build the miniature with as many curved lines as possible. “Everything we developed for the set we tried to develop around those circular S-shapes that were so popular back in the fifties,” continued Taylor. “We had to build in as many curves as possible because of the camera lens, and I really wanted to use the elements that were sort of sacrosanct from that period that we all loved and admired — the tailfins, the boomerang and molecule shapes, the kidney shapes and chrome that were so popular then. We took all those elements and developed them into a vision of the future, as though someone with a 1950s design sense was hurled forty years into the future. We tried to make it a real place, not cartoony, but an actual environment. We wanted there to be a certain amount of actual applied design from the fifties on what would be the newer buildings, while at the same time, in the suburbs, have older houses with bits of futuristic glotch stuck onto them — as though, for example, someone had developed a futuristic porch that didn’t really go with the house, but it was added on anyway. In a way, the futuristic Hill Valley could be described as an

Due to uncertainty over whether a prototype optical printer for the nonstandard film format would be ready in time, pains were taken to accomplish nearly all of the effects work in-camera. And because of the wide-angle fisheye lens mandated by the Omnimax process, steps had to be taken to disguise even normal rigging and lighting.

alternative *Blade Runner*. While *Blade Runner* applied futuristic elements to a crumbling, corroding past, ours was a cheerful, happy vision — a pleasant kind of applied design of the future."

The necessity of creating a fairly dark ambience was factored into the design. Trees were used extensively to camouflage what would otherwise have been a bleak expanse of sky overhead. "The shots had to be set at night to avoid the problem of cross-reflectance," explained special effects supervisor Hirotsugu Aoki, "and because of the fisheye lens, we wanted lighting actually built within the set to illuminate the scene. So we incorporated all kinds of lights into the buildings, and added neon and other lighted signs." To texture the setting, small photographs were positioned inside the windows. "Often when you see miniature buildings, it's very clean inside and it looks fake. But if we were to have built miniature curtains and furniture, it would have become extremely expensive. So we came up with the idea of hiring a photographer to go around and shoot some actual windows of houses and other buildings. Then we made color xeroxes out of the pictures and put them behind every window. A lot of times we put the photographs right on the window itself. They really helped create a more realistic look."

Many set pieces were invented simply to provide additional lighting. "When I did my initial set design," elaborated Taylor, "I invented a future reality where there were lots of things like little street kiosk-like structures, videocassette vendors, TVs, machines that might provide something if a card were stuck in, and so on. We developed a whole series of these little gizmos of varying sizes that stood around on the sidewalk. They were hollow in back and contained small projector lights. Additionally, all the houses were internally lit even though normally you wouldn't have all the lights on in everyone's house throughout a town. We built the entire street for the Hill Valley set as an underlit plastic road, so that all the words and directional signs were built into the road itself, as though they glowed internally somehow. Of course, that caused a great deal of aggravation for the model builders because they had a lot of trouble walking around on the model."

Another important consideration in designing not only the Hill Valley set, but all the sets, was equipping them with tracks to accommodate both the boom for Biff's miniature DeLorean and the boom that carried the Omnimax cameras built especially for the show. "We needed booms to get the camera out over the sets at a distance," said Trumbull. "And there were no booms available. So we designed our own starting with the camera and working back. We knew we couldn't use IMAX cameras because they all weigh about ninety-five pounds apiece, plus film and batteries. Besides that, we couldn't get those cameras into a miniature — and we were trying to shoot a one-inch-to-the-foot scale. In order to do that, the cameras had to be small. Ron Schmidt built three new Omnimax cameras for us using the classic Zeiss 30mm fisheye lens, which was offset from the lens center by half-an-inch. With Omnimax, the projection is never from the center of the dome — it's from somewhere near the back of the dome — and yet the horizon line is down low. To compensate for this, most Omnimax cameras are built with the lens center actually three-eighths-of-an-inch off-center — making the camera about eight degrees off-level in order for the horizon line to be in the right place in the dome. The horizon line is photographed curved, but when projected from this odd angle it comes out straight in the dome. In the 'Back to the Future' dome, the projector's even a little farther back than in most Omnimax theaters, so we went to a half-inch center offset lens. We designed the cameras with this built-in eight-degree variance and a rotating mechanism so the camera could roll like a plane — but on the axis of the horizon, not the axis of the camera or the

lens. It's a real cockeyed kind of geometry. The whole camera sort of swivels around off-center, and yet the horizon stays constant. That was all built into it. Also, the camera body and the magazine were eight degrees off-axis from each other so that the camera tilted up and the magazine didn't drag in the street. The camera was mounted into a yoke that had yaw, pitch and roll on nodal. We also built new heads for the cameras. The head had to be as small as it could possibly be so the total width of the camera would be only nine inches. We designed all the miniatures to accommodate it. Then we rigged up our booms so we could go out over the set — because we were actually shooting 180 degrees wide, left to right, and straight up into the ceiling and thirty degrees down. The cameras hung off our custom-made booms which were capable of moving fifteen feet while still maintaining an extremely tight motion control registration." Four new booms were built by Apogee under supervisor Mike Sorensen. Each was constructed to precise specifications out of a graphite fiber composite plastic, not metal, and was capable of extending up to about twelve feet. Extensions were added and removed as necessary for individual shots. Because of their extraordinarily light weight, the boom units were designated 'Super-Lytes.'

The omnipresent Omnimax eye easily picked up the Apogee booms during test shots — a situation that was inevitable yet troublesome. With the uncertainty that a working Omnimax optical printer would be available to matte out the extraneous equipment visible in frame, every effort was being made to keep postproduction composites to the barest foreseeable minimum. "We knew we were going to be able to see the booms," commented Susan Sitnek, "as well as the rigs used for flying Biff's car. So we decided to introduce soft split-field mattes as opposed to hard mattes — that way the edge of the matte would look fuzzy and wouldn't be articulate around the car. We knew that if we did a matte across the top part of the field in the first pass, and a matte across the bottom part of the field in the second, we could matte out the booms in-camera and keep opticals to a minimum. As it turned out, though, we ended up avoiding mattes all together. Dave Stewart, who was our director of photography, came up with a great idea. To disguise the booms as much as possible, he had the grips make tight-fitting black velvet coverings for all the rigs. It was a stategy that was intended to help save us a lot of time in optical, but it turned out to be much more. Because of the low-key internal lighting, we couldn't see the rigs at all on film. So we ended up not having to do any split-field mattes. It was a tremendous help. Because of

Ride participants are seated in an eight-passenger open car which is sent in pursuit of Biff Tannen who has stolen a time-traveling DeLorean and set off to disrupt the time continuum. In addition to the glitzy business district of Hill Valley, the vehicles pass over residential areas also constructed in miniature. Wherever possible, practical lighting was incorporated into the sets.

that we were able to do almost the entire show in-camera — simply by taking a lot of care in shooting."

The pursuit car — represented by the point-of-view camera — has a near-miss with another vehicle. Lead modelmaker Nell Corkin makes adjustments to the flying sportscar which is mounted on a rotating rod — concealed from the camera — that banks the car out of the ride-goer's path.

Another strategy that helped save time and trouble in optical — and elsewhere — was the building of foamcore scale models of all the sets. By doing that, each camera move could be precisely choreographed as part of the design process. "We mocked the whole movie up in miniature," said Trumbull. "We had miniature cars on sticks, and we'd run them through the little sets to calculate timing and velocity. Then we'd adjust the size of the miniatures and work things out until we came up with the formula that was roughly fifty feet of miniature every ten seconds. The camera really had to move to get the sense of speed that we wanted, while at the same time keeping the information in the center of the screen fairly focused and non-blurred. We programmed the trajectory of the camera first to achieve this. If we really had to pan rapidly for some reason, we had Biff's car come into the foreground and carry us through the pan. We would shoot several takes in video, constantly looking at the trajectory curves because they had to be dead perfect. Then we'd shoot a black-and-white test and play it later to see where we stood. That way, we knew immediately if the camera was going too fast, or if it was blurring or strobing — or whatever."

The original plan had been to composite Biff's miniature DeLorean into the shots using traditional bluescreen techniques. But after considering the problem of the interactive lighting that would naturally be reflecting off the silver car — and once again harkening back to the uncertainty of the optical printer — the decision was made to shoot the car within the miniature set in a single pass. "Luckily, Dream Quest had just struggled successfully through *The Abyss,*" commented Trumbull. "Their submarine shots used a nine-wire gimbal rig that was very effective. So we flew out to DQ, saw the wire rig and decided to give it a try. We did some tests where we built a quick miniature town, smoked it in, and hung a little silver Corvette from wires and shot it with a still camera with a fisheye lens to see what the problems would be. Sure as hell, the rig was in the shot. But luckily, Dave Stewart had come up with the idea of wrapping the booms with black velvet."

It was not until late in the production that the optical question was fully resolved. Although steps taken to shroud the flying rigs and boom arms eliminated much of the composite workload, numerous explosions and light effects were still needed to bridge sections of the ride film and create a cut-free' visual flow. Despite years of development — and some highly respected subcontractors laboring on the task — IMAX had been unable to engineer an optical printer capable of producing the essential rock-steady images needed for composite photography. The difficulty lay in the format's giant fifteen-perf frame which made it difficult for even the best engineered camera movement to hold the film perfectly flat. After testing a number of prototype machines that failed to produce satisfactory results, Trumbull learned about a multi-format printer developed by Imagica Japan that was reputedly capable of producing flawless composites even in IMAX format. Test elements sent to Japan were mated flawlessly and Imagica was contracted to do all of the optical work.

Mechanical effects rigger Lewis Gluck was given the task of refining the flying rigs rented from Dream Quest into something that would serve the unique needs of the 'Back to the Future' show. "It was my responsibility to hang and power the car and to fly the rig. Then, as the project developed,

some of the sets required that we come up with our own flying rig because the Dream Quest rig had certain limitations in the amount of pitch and roll. Their rig was twenty-nine inches tall; and on the ice crevasse set, it wound up hitting the ceiling. So I designed an adaptation of it. Like the Dream Quest rig, mine used nine wires; but it was a completely different approach to moving the car. I used a winching mechanism called a slash plate with a series of pulleys on each wire that reeled the car up and down on spools. That way we could get more roll and pitch. Plus the whole thing measured nine inches, so we saved a full twenty inches of frame. We made it a lot narrower so the wires were longer and closer together. We also changed the diameter of the pole so that when the rig tilted and banked the wires didn't go slack — that was because there was a different ratio of pulleys allowing less wire to spool out."

Like the Hill Valley set, the ice crevasse was an example of designing backwards from the problem to the solution. "We looked at a lot of pictures of ice crevasses in landscapes," explained Aoki, "and they were all very translucent, with light seeming to come from within. I liked the look very much, and it was a perfect solution for our lighting needs. I had seen other model crevasses made of painted foam or plaster that looked very opaque. So we built ours out of layers of fiberglass, instead, to create a sense of depth along with the translucence." An in-tergal part of the ice crevasse scene is an avalanche caused when Biff crashes his DeLorean insanely into the fragile walls of ice. Lead mechanical rigger Edward Hansen and crew came up with a motion control rig — programmed by camera operator David Hardberger — to make the breakaway wall sections collapse repeatably on cue.

After its near dip into an icy river, the DeLorean enters a time ver backwards and ends up in a volcano complete with flames, smoke and lava. Biff is pursued up and over the rim of the volcano, and a dense forest of cinder pyres is revealed. Out-of-doors settings such as the ice crevasse and cinder pyre sets were designed to be very natural and irregular-looking, thus rendering the distortion of the
Omnimax lens indiscernible. "I wanted to get things looking as organic as possible," commented Aoki. "It was very important to get rid of any evidence of human design — which is a very difficult thing to do. People have a tendency to repeat shapes and create patterns and symmetry. I wanted to have accidents — to have some shapes just happen. It also helped having everything dark. The colors were basically indescribable. I didn't want to put any kind of straightforward color that was, for example, clearly red or clearly green. I wanted yucky, unclear colors."

The DeLorean darts in and out of the pyres and then draws near to what appears to be just another inert rocklike shape — but which in reality is a rather cranky tyrannosaurus rex. The look of the dinosaur was developed through early storyboard meetings, with its rough texture and shape intended to blend in with the surrounding cinder formations. Mechanical supervisor Kenneth Walker oversaw the initial design and fabrication of the nine-foot-tall animatronic creation based on Aoki's original sketches. Walker had joined the team early on and began by generating preliminary designs, as well as small-scale mockups of the tail in plexiglass, wood and cardboard. He and his crew — including codesigner Ed Hansen, Drew Zelman, Tom Quinn, George Bernota and Patrick Shearn — then spent nearly five months developing and building a multi-channel Lynx *Robotics* system to breathe life into the otherwise inanimate object. "I decided early on," said Walker, "that the legs would be nonmotorized and would not be moving under their own power. It was the

only way to try and meet our schedule. We began by designing a cart on rails with an up-and-down pedestal and a turntable on which the T-rex would be mounted. The idea was to rigidly attach the feet of the creature to the set and let the forward movement of the cart and the up-down movement of the pedestal 'bend' all the leg and ankle joints in a realistic manner. A real body seems to do this, as well — by moving and twisting the upper body, the legs appear to move on their own."

The ride-goers chase Biff into the far-distant past. At one point, both vehicles descend into a fiery volcano and are swept away by a river of lava.

Suspended over a lava falls, lead modelmaker Mark Stein examines the two-story set prior to shooting. Methylcellulose slime — backlit with intense red-orange lighting — was mixed with chunks of hot-melt vinyl to produce a convincing simulation of molten lava. Gravity carried the lava through the set and into a collection tank where it was then pumped back up top for reuse.

In a departure from the 'Back to the Future' norm of preplanning each detail of the ride in minutia, Walker and crew basically designed the dinosaur *as* they built it. "The only thing I really designed ahead of time was the compound tail structure device. There just wasn't enough time to do more than that. I started with the tail because it seemed rather important to the believability of the dinosaur. It was made up of disks, and was machined out of aluminum by Kan Ikeuchi. After that, we basically began work on the full-scale T-rex with no prototype in between. My overall approach was to divide the T-rex into subassemblies that would then, hopefully, come together in the end. By treating the tail, neck, head, arms, legs and body in this manner, each section could be built more or less independently, and different people could be working on different parts at the same time. Tom Culnan — who had originally joined the production to work on other rigging jobs — eventually came on as cosupervisor and proved to be a great asset."

At another juncture in time, the vehicles pass through the ice age where ride-goers are exposed to a stunning vista — another miniature set.

When Walker was forced to leave the project for health reasons, Culnan replaced him as supervisor and saw the assignment through to completion — in the process, incorporating numerous design and construction modifications. "Unlike mechanical creatures in other films," stated Culnan, "the T-rex was in every sense a real robot. It could rival an industrial robot in precision and movement. Not only could it provide natural-looking, fluid movement at motion control speed, but it was so precise that we were able to back it up to a specific frame, if necessary, and have it resume its original position."

At the heart of the tyrannosaurus was a very stable and repeatable armature built to exacting tolerances demanded by the robotics industry. Stepper motors, which by their nature are very precise, were used to help animate the construct. Limitations imposed by the creature's outer skin — designed and fabricated by a separate crew — and the necessity of concealing from the Omnimax fisheye its inner workings created a few difficulties. "We had a major disadvantage working against us," noted Culnan, "in that unlike most motion control rigs, ours was unable to have any mechanics on the outside where they would have been accessible. We had an anatomical character — it had to be covered with a flexible material — and in order to be stage ready, we had to close it up. We had to literally put a flexible rubber skin around a robot — and once that was done we no longer had access to the internal mechanics. For that reason, we had to be a little more picky than usual about what we considered to be ready for shooting."

The tyrannosaurus epidermis was sculpted, molded and cast by Gabriel Bartalos and Daijiro Ban, aided by Paul Mejias, Bill Messina and Paul Reilly. The primary painting of the creature was done by Ron Cole. The skin was a combination of foam latex — primarily in the heavily articulated areas of the face and tail — while the body, because of its mass, was made of urethane foam. Although only one animatronic dinosaur was built, it was cosmetically and mechanically altered to appear in the film to be two separate animals — one old and one young. Body attitude and the amount and

quality of movement helped to differentiate the two. The older, lumbering version, for example, was programmed quite differently from the younger, more aggressive male who snaps at the DeLorean as it flies past. Cosmetic alterations such as broken teeth and withered features contributed to the ruse.

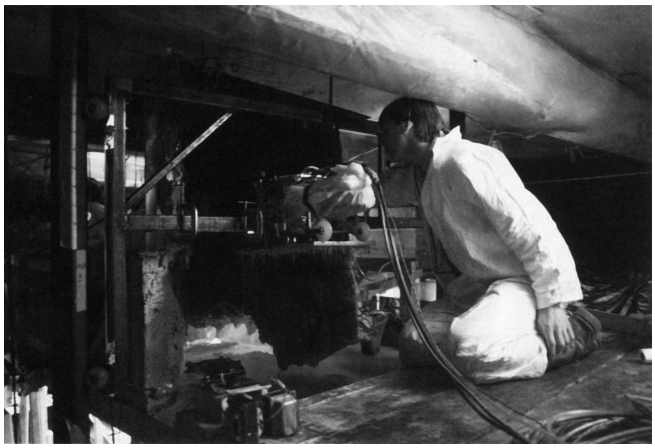
Stop-motion animator Laine Liska was responsible for devising the dinosaur moves which were then programmed into the motion control computer by Richard Coppola. “I was something like the choreographer for the tyrannosaurus,” explained Liska. “They needed somebody with some flavor for action to make it look more natural and less like a robot.” As a reference, Liska used a small wire-frame armature that he could bend into various positions. “The big dinosaur had all the basic principles of stop-motion and go-motion, only we never touched the robot itself. I couldn’t go up and grab anything and move it. It took me a couple of weeks to get used to the idea that the model was in a completely different place and untouchable. I used standard animation sheets — the kind used in animation for dialogue — as a graph that plotted left and right on each motor. All the key frames were entered into the computer, which completed and smoothed out the move. Then we’d go back and tweak it a little bit until everything started looking pretty nice. We got it down to a system where it took a couple of hours to figure out the program and about an hour to enter it.”

At this point in the ride, Biff manages to irritate the young tyrannosaurus into snapping at him — chomping on his car and spitting it out disabled into a river of molten lava. The pursuit vehicle containing Doc Brown’s posse of ride-goers manages to follow Biff both into the creature’s mouth and out again into the simmering flow. While creating the volcano and cinder pyre sets was a fairly straightforward application of wire and papier mache, the accompanying lava flow and falls were a different matter altogether. Modelmaker Mark Stein and crew had the arduous task of creating the four-story set complete with lava trough and molten methylcellulose lava. The process began as with all ‘Back to the Future’ ride sets — with a miniature of the miniature. “We started with a quarter-scale model of the set,” said Stein, “and from that built the full-size version. We began with two processes. One was sculpting the roof sections, the other was putting together the structure that was developed into the lava falls area. We designed the set to be very craggly and bent and scary — keeping things as organic and abstract as possible. We then built it out of quarter-inch steel rod and eighth-inch copper wire with insect screen and gray papier mache. Only the lava trough was made of fiberglass. We chose papier mache for two reasons. First of all, I thought it would have a really good look. It’s a material I’ve used before in trying to simulate rock — especially this kind of rock that didn’t have a sculpted surface. We also chose it because it’s nontoxic. We were working on this part of the project during the month of December, and the temperature was often about ten degrees below zero. The part of the mill we were in didn’t have much heat and very little ventilation, so I didn’t want to work with another substance that might be unhealthy. Papier mache has been used in special effects for sixty years — it’s nontoxic and it works great.

“Instead of taking a literal approach to the sculpting phase, we took a very abstract approach. We actually analyzed things like form and negative space and line, just to make interesting spaces. We approached it exactly like an abstract sculpture — kind of like basic first-year art school.” Concurrent with forming their gigantic modern sculpture, Stein and crew began putting the two-story lava falls section in place. Fiberglass surfaces were created over which the lava would flow between interspersed rock formations. Stein called upon a technique that had served him well while working on the indoor tropical rain forest, ‘Jungle World,’ at the Bronx Zoo. The model builders bent quarter-inch rod and sculpted the forms where both the fiberglass and the papier mache rock would be placed. The frame was then covered with chicken wire, with flexible foam sheet layered on areas that would be surfaced with fiberglass.

Temporarily disabled, the participant’s car tumbles over the edge of an ice cliff and plummets toward a river far below. To facilitate photography, the set was constructed on its side. Camera operator Harry Alpert — assisted by Allen Stillman and Greg Booth — programs a motion control shot. Lightweight cameras and boom arms were designed and built specifically for the project.

Backlit methylcellulose was the obvious choice to simulate the lava flow. At the proper consistency, however, it appeared flat and uninteresting on camera. To impart a roiling effect and some variation in color, Stein added chunks of hot-melt vinyl known affectionately as ‘worm juice’ because of its primary application in the making of artificial fish bait. “Basically we scrambled up a hundred and fifty gallons of worm juice in different shades of red, orange, pink and yellow, and then stirred those small chunks into the methocel lava to give the surface a nice textural quality. It looked pretty disgusting until it was lit up. Then it looked really great — especially from the camera point of view which was skimming right along the surface.”



Machinist George Bernota prepares to send a camera — wrapped in plastic bubble-wrap — down a ramp and into the lava flow. A custom camera rig was developed for the passage. Motorized and mounted on guide rails, the tractor device literally drove through the constricted set towing the camera.

A unique pumping system was devised to channel the lava flow through the tunnel. Two large wooden distribution tanks were built on the top level of the set: one for the tunnel and one for the lava falls. Ten wooden in-flow set tanks channeled lava through the entry to the tunnel to divert the substance in a manner more interesting than if the lava had been introduced from a single static source. A large collection tank was placed downstairs to receive the lava flow, which was then pumped back up to the distribution tank. “Our whole distribution system was much like an old Roman sewer system,” elaborated Stein. “We just let gravity take the lava from the top floor, through the set, and down to the collection tank. It was then pumped back upstairs —just one time — using

a food processing pump with an air diaphragm to avoid aerating the methocel. Two passes were all we could get out of it."

As with other 'Back to the Future' sets, the lava flow was illuminated from within. "Everything is backlit," continued Stein. "All the fiberglass was backlit as was the translucent lava that travels over it. It appeared to be glowing red hot — which was one of the intentions of creating this set in the first place. We learned a lot about the way methylcellulose flows." Ed Hansen and crew came up with a custom camera rig for the assignment. "The lava flow rig was interesting because we knew we weren't going to have a computer available at that point in the production. And since we were using an organic substance like methyl-cellulose — and were traveling the camera down through a hole where it was completely captive — there was no way to motion control it precisely through the flowing stream. Because the lava moved at its own pace, we simply couldn't rely on the motion control rig making the trip in a set amount of time. It was so unpredictable, everything we did had to rely on human control — sort of like a real-time motion control. It took several operators all sitting with their little dials and speed controls for their given motor just to make it work. The nice part was that it was a one-second exposure with two seconds per frame, and we knew where the camera was supposed to be at any given time. We had video surveillance cameras inside the flow and intercom systems to communicate with each other."

Hisao Taya designed the tractor that actually conveyed the camera down through the lava flow. Motorized and mounted on guide rails, the device literally drove through the lava flow set towing the camera. Initially, however, the movement of the vehicle in its hill-climbing mode was tank-like and sufficiently jerky to alter the camera position between frame exposures. To smooth out the ride, the device was fitted with little treads and driven through the lava flow with patches of sand glued to the track to prevent fishtailing. When it came to a hill, it was driven onto an aluminum plate with an air cylinder locking mechanism that carried the camera over the top and down.

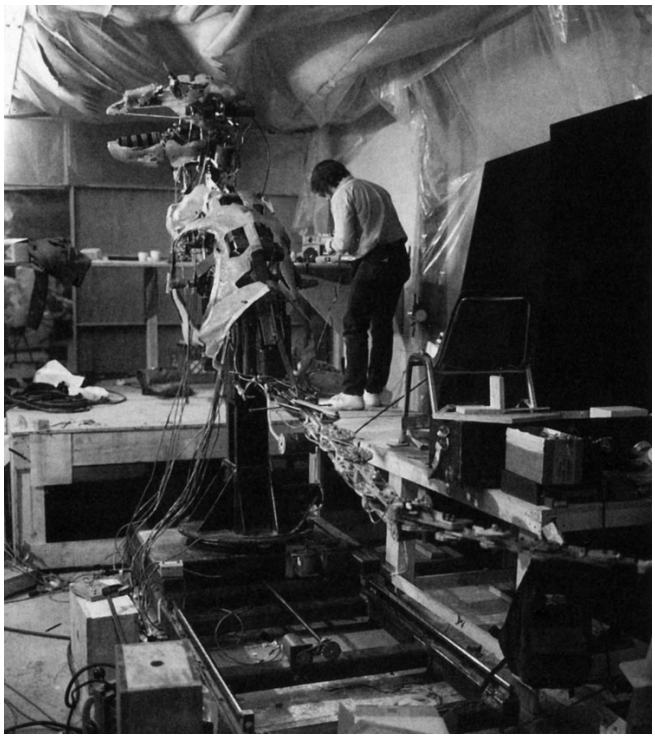
One of the peculiarities of shooting anything in miniature is that without an atmospheric simulation, the reduced scale of the set is instantly apparent. When looking at a distant mountain, the shape seems somewhat indistinct because both the distance and the atmosphere affect its appearance. When filming a sixty-foot set from sixty feet away, there is no atmosphere to create the illusion of distance and it looks, not surprisingly, unrealistic. To eliminate the problem, Lewis Gluck and electronics engineer Seth Nathanson used mineral oil atomized by large air compressors to envelop the sets in a delicate particulate mist. "The most difficult part was maintaining the oil smoke at a specific level between takes," elaborated Gluck, "especially at the beginning when we thought we would have to do matte shots throughout the whole show. I started doing tests with the Omnimax lens on a still camera using a temporary matte box I'd rigged for split-field mattes. The shots looked as if somebody had drawn a line right through them due to the different smoke densities from one exposure to the next. So it became absolutely crucial to find a way to match the smoke density levels between takes. Seth began researching different ways of measuring the density using lasers and photo-optical sensors. My job was to come up with an oil cracker that was repeatable. I looked in the Thomas Register — which is an amazing book advertising everyone in America who makes anything at all — and tracked down a company that made high-tech atomizing nozzles. They're the kind of nozzle used for coating pills, putting finishes on metal and so on. We ordered one, right off the shelf, for $126 — we'd priced hand-crafted special effects nozzles at up to

$3000 — and it worked beautifully. Seth came up with some of the equipment for a particle counter, and we ended up being able to crack oil at exactly the level we needed — and easily match the levels from one shot to the next."

The fastidious attention to detail throughout the filming was married at every turn with precise simulator platform programming. Every camera move was matched — to the frame — with the appropriate kinesthetic experience. Realizing from the outset that the only way to achieve this level of precision was to have complete access to an on-site simulator and Omnimax projector and dome, Doug Trumbull made sure that the necessary equipment was installed at Berkshire Ridefilm. "There's a very strange kinesthetic relationship between the attitude and velocity of the camera and the attitude of the hydraulic motion. We found that it had to be so tightly synchronized it was almost like lip-sync dialogue. It was a whole new kinetic kind of art form that was just beginning to be understood. The only way to do the job was to set up the dome and projector, put in the car, put in the hydraulics and a temporary sound system and then shoot tests. In no other way could we know for certain what we were doing. With this kind of technology, you don't know what's right until you try it."

The 'Back to the Future' eight-passenger hydraulic simulators were manufactured in Switzerland by the Intamin Corporation, a company specializing in the design and building of equipment specifically for amusement parks. The warranted product was built to withstand the incredible abuse that would be leveled upon it over time with clearly stated velocity and G-force limitations, plus a battery of redundant safety controls and sensors. Its size — much smaller than the forty-passenger simulators used in 'Star Tours' — made it remarkably maneuverable.

"Each scene in the movie was actually an experiment," noted Trumbull. "We couldn't just start shooting in a vacuum, so we started shooting the movie in continuity, experimenting as we went, shot by shot. My desire was to set a new standard of visual and motion synchronization so that the kinetic and visual experience would be as effective as possible, and without any of the motion sickness problems sometimes associated with simulators. Obviously, with the limited movement of the simulator platform, sustained kinetic movement is impossible. But as long as the physical cue coincides with the sudden movement of the camera, the viewer's vision then carries it off — which is true in actual flight. Motion cues are very brief and the rest of the experience is visual. In the movie, there was a sense that the vehicle was roller-coastering; but in reality, the camera was absolutely level throughout the shot — it was the vehicle that was doing the roller-coastering. It gave the right effect because the camera, although it stayed level, was moving up and



In the age of dinosaurs, ride-goers encounter a pair of irritable carnivores intent upon dining on them. Six months of development were required to perfect a nine-foot-tall fully mechanical tyrannosaurus that could be

down through the shot very radically — which meant that its trajectory was downward or upward. If the camera was level, but the trajectory was up at thirty degrees, we could tip the vehicle up to thirty degrees and make it appear to be going up. We discovered a lot of kinetic effects that really worked great. But when we coordinated the movement the wrong way, it was instantaneously sickening. Another thing we found was that it wasn't possible to watch the film very well without being in the simulator. Without the movement, it just didn't make sense."

operated under motion control. Cosmetic alterations enabled a single beast to serve as both the passive Tyrannosaurus and the carnivorous dinosaur in pursuit of the Omnidrive. The eye fins are activated by a motor concealed within the flexible rubber skin.

Trumbull and ride programmer Michael Arias employed both the video and black-and-white test shots to determine the motion of the simulator. Grid plots were used to chart the positions of the four hydraulic axes over time. "We would go through and plot our ideas of how the shot was going to look from the ride vehicle motion standpoint," explained Arias. "It wasn't altogether an intuitive process, simply because a lot of time we were fighting against the motion that was shot, against what was happening on the screen. For instance, in one shot, we went up a hill and then down, and the camera move on the stage involved fifteen degrees of tilt up and down. One would think that going down the hill the car would be accelerating, but the way to make it feel like acceleration was to tilt the car back — which was hard to reconcile with a camera move that was being tilted down. It was compounded by the fact that the stage crews really played it safe when it came to their moves. They had to, because depending on what car you are in with relation to the screen in the final ride, you could be looking down at everything or you could be at the very bottom looking up. Certain camera moves would be pretty much meaningless to the people who were all the way up on the right side relative to the people who were down in the center."

Arias spent some time initially building up a database of platform moves that would work with specific camera moves. "To a certain extent, I was able to create new simulator moves based on previously programmed moves that were similar. But the software was insufficient for me simply to be able push a few buttons and have a move duplicated. I was able to refer to older movements, but I still had to enter the move myself. The software we used — made by Anitech Systems — was modified for our purposes, although it was mainly intended to be used as a motion control graphic editor. We were able to go through and look at the plot of the position of each axis against time. The movie frames were written across the bottom of the plot, with the axial positions relative to zero extension written vertically. We were also able to consider it as velocity over time as we plotted our key points. Each scene had its own file; and when I had several scenes from a sequence, I could cut them together just like an editor would cut a film together. Then I could call up the resultant file and play it back on the car in sync with the projected action."

The 'Back to the Future' ride opened at the Universal Studios Tour in Florida in the spring of 1991. Throngs of theme park patrons, eager to be whisked away to yet another alternate reality, immediately recognized the dawn of a new era in simulator-cinema. "I know that right now the simulator ride is in its infancy," concluded Trumbull. "Movies have always been movies and amusement has always been amusement — but now there's this new hybrid art form of film and sound and kinetic motion. It's a whole new business that very few people really know about. We're just beginning to learn about these kinetic effects. We're finding that there are kinds of

combinations of cues that just make you laugh hysterically because they're so outrageous, and there are certain kinetic things that can really genuinely get your adrenaline going. You can be physiologically stimulated in a way that is more subjectively real than the passive experience of watching other people chase each other on the screen. Movies are nothing but a proscenium arch event where you are a passive observer — you get involved via empathy and humor and excitement and interesting characters, but decidedly as a spectator. The simulator ride is a much, much more active experience. Even though it's prefabricated in the sense that we spend thousands of man-hours giving you that second on the screen, it is ultimately a sort of interaction with reality — with characters and situations and a genuine kinesthetic experience. It doesn't have to be four minutes of absolute rock-'em, sock-'em, gut-wrenching roller coaster thrills. In fact, I think the medium will mature into something that's richer and more spectacular, more beautiful and more subtle — but just as sensory, just as transportive."

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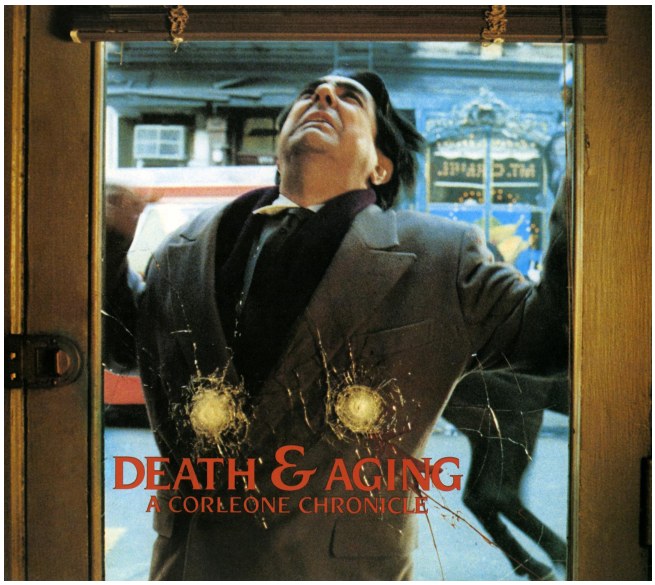
DEATH & AGING
A CORLEONE CHRONICLE

article by
David Morgan



Mario Puzo's best-selling novel *The Godfather was* a rich resource from which to create an epic motion picture, allowing for a passionate, bloody family saga to be painted on a wide canvas. Writer-director Francis Ford Coppola — one of the most promising young filmmakers to emerge from the sixties and a recent Oscar winner for his *Patton* script — brought to vivid life the history of the Corleone family, whose business dealings included extortion, murder, gambling, prostitution and political influence peddling. It was a portrait of the American Dream — a poor immigrant coming to the New World to make good — turned on its head.

Premiering in early 1972, *The Godfather* became a cultural icon — and recently a 'National Treasure,' as decreed by the Library of Congress — and its critical and commercial success was further enhanced by the prestige of its successor, *The Godfather Part II*, released two years later. Both films, winning numerous Academy Awards including best picture, set new standards for the gangster genre, not only for their acting, writing and directing, but also for their technical achievements. Many veteran craftspeople were hired for both films, and many more returned for the recent follow-up, *The Godfather Part III*, which ended the saga in more contemporary times and brought the life of the tragic central figure, Michael Corleone, full circle. *Part III* did not receive the overwhelming critical and boxoffice support that the first two films had and much speculation in the press surrounding its making was directed towards the largesse of the production — estimated to have cost $54 million — as if expecting Coppola, whose career had faltered since *Apocalypse Now*, to fall flat on his face with the franchise that had originally put him on the map.

Filming in Rome in late 1989 and through the first half of 1990, Coppola downplayed the rumors of production problems on the set, of difficulties with the actors or of his own motives for accepting the project. Having expressed distaste towards becoming involved with previously announced sequels to his two films, Coppola finally produced his own, which had as much to do with the tragedy of *King Lear as* it did with mob violence in Little Italy.

When Coppola first sought to engage Marlon Brando as the powerful patriarch Don Vito Corleone, Paramount executives bristled at the idea, partly due to the lackluster performance of the actor's most recent films. So Coppola conspired with Brando and Brando's personal makeup artist, Philip

Rhodes, to produce a videotaped screen test featuring Brando as the Don. The crude makeup test consisted of some graying hair, mustache and cotton in the cheeks, but it was enough both to fool the studio executives — who failed to recognize the actor — and win Brando the role. Brando *was* Don Corleone, the studio admitted, and so he could not be refused.

Dick Smith, a veteran film and television makeup artist whose specialty was old age makeups was hired to transform the forty-seven-year-old Brando into his sixties. Although he found the actor initially receptive to the use of cast latex appliances — the approach he had used to age Dustin Hoffman some ninety years for *Little Big Man* — Smith met with growing resistance towards any makeup techniques that were overly complicated or time consuming. "I understood Marlon's concern," Smith observed. "What actor wants to spend a lot of time in the makeup chair? And also what actor is like Olivier, who *loved* to have a lot of makeup put on? Most of them don't. Marlon was very sweet about it, but he was adamant — no appliances. What he was suggesting was that we just do something to plump out his face and put old age stipple to wrinkle his skin and things like that; he'd get his hair dyed just right, too. Not much else.

"I *did* do a test. I put some latex jowls on him; and to be very honest, it wasn't any better. I got him to the dentist to have his teeth cast because we decided to have made what we call a dental plumper, a kind of metal bar that goes around between the teeth and cheeks and hooks onto the molars with plastic. Then attached to that bar are plastic forms to plump out the jowl area. It isn't the most realistic thing in the world, but you can get by with it. Incidentally, the slur in Brando's speech had nothing to do with the plumpers. That was simply his own choice of the way to talk."

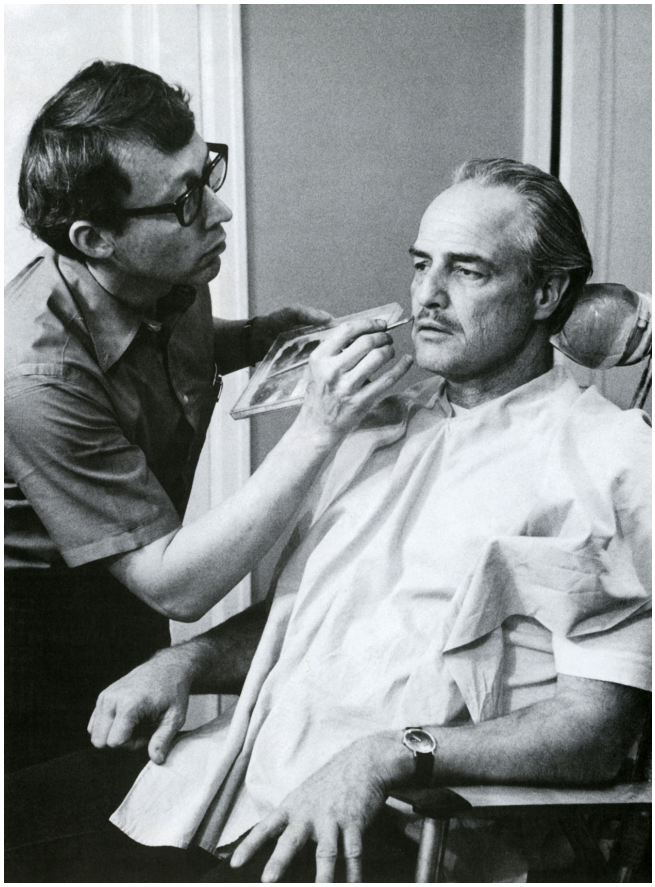
The makeup applied by Smith and Rhodes was not complicated, but it was dramatic enough to show the physical deterioration of Corleone, particularly in his final scenes. "Brando's hair at that time was already blond and a sort of salt-and-pepper gray," Smith recalled. "It would almost have photographed as if he had gray hair. So what he did was separate out his temple hair and some bits along the upper hairline and have all the rest dyed very dark. His hair was just combed straight back and was already thinned, so all I had to do was emphasize some of these little gray streaks and that was it. Simple. Then Phil and I would do the special latex or old age stipple technique, put two or three layers of this stuff on his skin and stretch it to produce wrinkles. I would add some colors to it, emphasizing certain lines, put a little gray in his mustache and put dark tooth enamel on his teeth to make them look dingier from tobacco stains and so forth. And there were some liver spots, little touches like that. It took an hour and a quarter to do the makeup."

The plumpers which had been worked on by dentists in both New York and Los Angeles, however, did not create the desired jowl-like protrusions; and so Smith found himself making adjustments to them during the first days of the shoot. "I had to remake them on the morning we began, spending two or three hours building them up and reshaping them and so forth to get them to work. In the first days of shooting, the jowls they created were too obvious. It was a matter of changing them a little bit every day to get them right."

While the physical transformation of the actors had to remain invisible to the audience, the physical effects created to portray the violence of Mafia-style warfare were the most obvious aspects of the production. Special effects artist Sass Bedig, who had worked with Steve McQueen and John Wayne — and later with Clint Eastwood and Sam Peckinpah — was fresh off of *The French*

Connection when he began filming tests of bullet effects for Coppola. He would later assume the added responsibility for preparing all of the breakaway glass used throughout the film. Bedig was joined by veteran effects man A.D. Flowers, whose credits included *Thirty Seconds Over Tokyo, Forbidden Planet* and *Tora! Tora! Tora!*, and by Joe Lombardi, whose extensive TV background included three years on *The Untouchables*. Though all three worked out of Los Angeles, Flowers was the only one who stayed on set throughout the shoot. Lombardi — in addition to attending some of the shooting — supervised the construction of materials and rigged props and scenery necessary for the effects sequences.

Both Flowers and Lombardi found it easy to engage and nurture a trusting relationship with the director, who could be both detail-oriented and spontaneous during shooting. "He is one of the few directors who really sits down with his effects man or his set decorator or other crew members and speaks with them on a one-to-one basis," said Flowers. "We discuss what we can do, he discusses what he wants done; and if we can do what he wants, then we devise a means of doing that. But Coppola does put a lot of preparation into each one of these scenes, and he was very thorough in that way. Coppola writes as he goes along; he does get new ideas, but he's also well-versed enough to know that he can't really expect you to pull the impossible out of a hat. With the impossible he gives you twenty minutes to do it whereas generally he gives you ten. He's wise enough to know the difference. You use effects for effect, but you also use effects to enhance the picture. Coppola doesn't want to add a scene just because of an effect, whereas some directors go ahead and put them in anyway — the story starts to drag and so they go out and blow up a car." Still, Coppola had a major flair for the dramatic, and in Flowers and Lombardi he found willing collaborators in pushing the limits of phyiscal effects. "Francis' big thing is 'Has anybody done it before?'" noted Lombardi."'No, Francis, first time.' 'Okay great, let's go!'"



For The Godfather — the first installment of Francis Ford Coppola's epic treatment of organized crime in America — makeup maestro Dick Smith was called upon to age forty-seven-year-old Marlon Brando to his sixties for the title role of Don Vito Corleone. When the actor resisted the use of appliance makeup, Smith had him fitted with a device that could be worn inside the mouth to create jowl-like protrusions. Brando's light-colored hair was dyed dark and then streaked with gray, and his facial skin was treated with two coats of old-age stipple to produce a profusion of wrinkles.

"Certainly on *Godfather I* there was very little time for preparation," said Smith. "And because of the way Coppola works, he likes to be very spontaneous. Things were kind of winged as we went along. Certain things would come up as last minute decisions; and while that's okay, it posed a problem sometimes — like the day we shot the assassination attempt on Brando and he's lying in the gutter. Francis told me the morning we

arrived that he wanted a couple of gallons of blood. I said: 'Francis, I wish you'd let me know. I don't carry around *gallons* of blood.' You didn't do it in those days; you'd have maybe a little bottle of it. So we had to scrounge around, send runners off to find Karo syrup and food coloring and stuff like that and make up enough blood for the scene."

With Coppola, it was quality and quantity that mattered; and the effect that the scenes of violence had on *The Godfather's* audience was much more gripping than in most other films in which violence is either extraneous or unrealistic. Partly this had to do with the graphic nature of the footage — blood was not spared — but it also had to do with the carefully detailed characterizations of the actors so that the violence inflicted upon them, or *by* them, carried more emotional weight. The Corleone clan is deceptively respectable in its business and familial dealings. An early sign of the lengths to which the family will go to get its message across occurs when an uncooperative Hollywood film producer, unwilling to accede to the Don's wishes in a bitter contract dispute, awakens to discover the decapitated head of his prize horse in his bed. When a prop head proved unconvincing, a real one was procured from a slaughterhouse as a substitute. Curiously, Coppola received more criticism for this violence inflicted upon an animal than he did upon any of the human characters.

Often the violence was quick and unexpected — as in a scene where Corleone enforcer Luca Brasi is murdered in a restaurant bar. One of the assailants drives a knife through his hand to immobilize him while another garrotes him from behind. The impaling knife — a partial blade rather rudimentarily welded to a small plate — was attached to the back of actor Lenny Montana's hand by Dick Smith and camouflaged with mortician's wax. Montana had to hold his hand completely still, as if he were nailed to the spot, even as his character is strangled and sinks to the floor.

Perhaps the most brutal sequence of the picture involved the assassination of Sonny Corleone (James Caan) as he drove into an ambush of gunmen waiting at a highway tollbooth. "We were only going to do a few bullet hits," recalled Lombardi, "but we ended up with almost forty in each take. In all, there were about eighty body hits on him for that scene." Five suits of clothing were prepared so that Caan could change quickly and be readied for additional takes. "We also had two tollbooths," Flowers elaborated. "As Caan drove in between the tollbooths there was one on the right and one on the left. After the one on the driver's side was riddled up, we would just change tollbooths, because both of them were already rigged. So that whole scene was shot in a day."

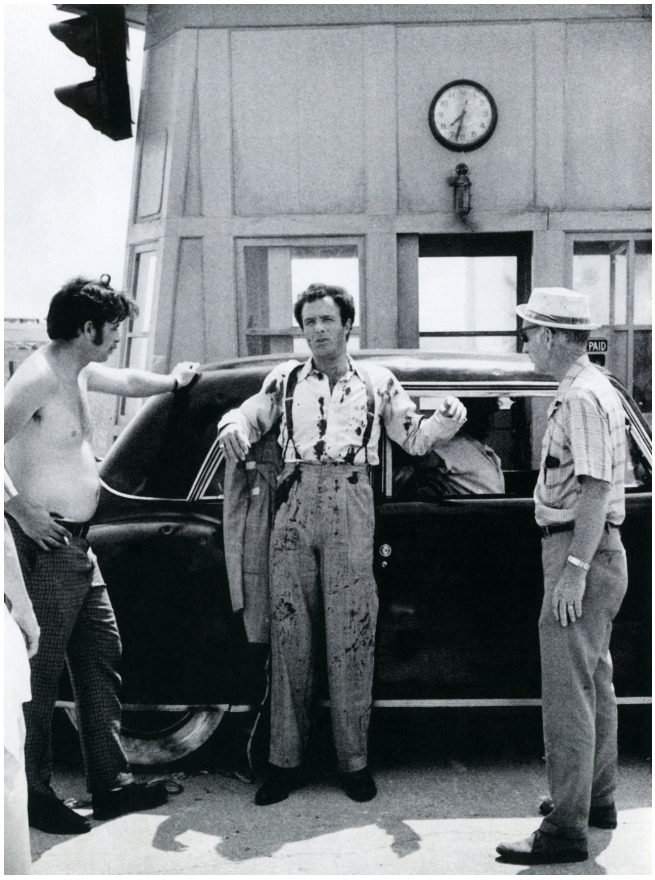
Special effects men had experimented with bullet effects since the earliest days of filmmaking. Once an ideal explosive compound was developed, small standardized explosive charges called 'squibs' were manufactured and supplied in bulk to film studios. They remain much the same today. Squibs can be hidden in scenery or wardrobe, or used with makeup, and are triggered electronically by an effects person. "Squibs are classified as 'Class C' explosives," said Flowers, "which are relatively safe because they are packaged in such small quantities. The compound is different from gunpowder because it doesn't give off smoke. If we shoot in low lighting, we have to use a squib that will not put out a flash. Normally the camera won't pick them up if we set them off in daylight, but sometimes we add some dust to kill the flash. If we want to simulate a bullet hit *on* somebody, along with the explosives we use blood which is placed in a bag that explodes with the squib to give the effect of an actual bullet hit. Each hit has to be backed up with a plate against the skin to keep from injuring the actor."

In sheer volume, the tollbooth shootout was similar to the climax of Arthur Penn's *Bonnie and Clyde* in which the bank-robbing lovers fall victim to scores of shotgun blasts filmed in slow motion. Coppola eschewed slow motion for his scene, making the death of Sonny scathing rather than elegiac. But he knew that comparisons would still be made, and therefore his staging had to be different. Rather than keep Sonny in the car throughout the attack, Coppola decided to have him struggle out the door, prolonging the shootout, but also requiring the bullet hits upon his body to occur both within and outside of the vehicle. "We had to do it in two cuts," Lombardi recalled. "Each squib had to have its own wiring, so there was no way we could just have Caan get out of the car because there would have been a bundle of wires on him. So in the first cut, we kept him in the car and blew the whole thing apart. Then we got a second car ready, switched the tollbooth around, and we put Caan back in the car. But now we had all the wires outside of the car so we could continue the action, following him out into the causeway. The film editor did a good job of cutting everything in to make it look like one continuous scene."

In addition to the body and scenic hits, it was determined that Sonny should suffer some facial hits, as well. Dick Smith rose to the occasion by creating tiny 'blister' appliances containing blood that could be glued onto the actor's skin and ripped open with nonvisible monofilament wires. The approach was not without its problems. Storing and applying the delicate pop-top' devices was tricky at best. "They were a bitch because they tended to leak. It was like handling eggs — you could easily break one getting it on. Then something went wrong with the scene — we had to cut in the middle of a shot — and all the blisters were already ruined. We were losing daylight and there wasn't enough time to do them all over again, so we had to abandon them. As a result, at the tollbooth there's not a single bullet wound on Caan's face — they're all on his body. We put some blood on his face for a final shot, but in the action there are no hits on his face."

Following the killing of Sonny and the attempt on his father's life, Michael Corleone (Al Pacino) resolves to seek vengeance, both against Don Sollozzo, suspected of ordering the hits, and Police Captain McCluskey, who has joined an alliance against the Corleones. After arriving for a meeting with the two in an Italian restaurant, Michael retires to the washroom where a revolver has been hidden for his use. Retrieving the weapon, he returns to the table and fires point blank at both men.

The attack on McCluskey (Sterling Hayden) was particularly gruesome in that he was shot straight in the forehead, blowing holes in the front and back of his head. "The effect was accomplished by placing a metal plate on Sterling's forehead," said Smith. "A squib was put on top of that, and the whole forehead was covered with foam latex skin. But I left an area around the squib unglued so that I could take a hypodermic needle, prick it sideways through the skin and squirt in a certain amount of blood to fill that shallow cavity — not so much that it would bulge. Then when the squib blew, it would blow a hole in the skin and the blood would pour out. The great trouble with that approach is that it takes a lot of time to put it on. Then after each take, you have to remove it all, clean up your actor and prepare him for another shot."



For a bloody scene in which Sonny Corleone is gunned down at a highway tollbooth, effects supervisors A.D. Flowers and Joseph Lombardi wired hundreds of explosive squibs onto actor James Caan, his car and the booth. Caan rehearses the action for effects assistant Eddie Duran and Flowers.

"For the restaurant scene," noted Bedig, "Coppola wanted a reddish look in the lighting to create an eerie impression like there was blood in the air — just to offset the whole flat white of the restaurant. So I came up with a mixture of talcum powder and red coloring which we would blow around to give the atmosphere a faint reddish density." Cinematographer Gordon Willis had doubts about the approach. "Gordon was concerned that it might not be picked up on camera — it was very lightly done — but it was fine. It fit right in and Gordon went for it."

When the production shifted to Italy for two weeks for the scenes of Michael's exile in Sicily, budgetary constraints dictated that neither Flowers nor Lombardi be brought along. For a scene requiring a car to be blown up in a botched assassination attempt — killing Michael's bride Appolonia instead of him — an Italian effects person was assigned to the task. "He was like a demolitions expert," said Flowers. "He didn't fool around. He *blew it up!* He used actual high explosives and pieces of the car just went everyplace. Luckily nobody was hurt. After that, the production decided they should have an American effects man the next time around."

Smith was not taken to Sicily either; and consequently, the appliance he had prepared in advance to depict Michael's broken cheekbone went unused. In lieu of appliances, the Italian makeup artist simply applied a smudge of coloration to Pacino's cheek. As a result, his facial bruises — carried over from the previous New York scenes — did not entirely match the footage shot in America. Later, after watching a screening of the film, Smith was so depressed by what he called a 'ridiculous makeup' that he wrote to Paramount requesting that his credit be altered to read 'Marlon Brando's makeup by…' so that he might not be deemed responsible. Smith's credit remained.

The climax of *The Godfather* is a montage of scenes depicting a Mafia bloodbath intercut with a baptismal ceremony. Although a couple of the

To create the impression of facial bullet hits, Dick Smith applied delicate blood-filled blister appliances that would rupture when their monofilament trigger lines — invisible to the camera — were tugged. When a problem scuttled the first take — after the blisters had already been broken — the labor-intensive effect had to be abandoned for lack of setup time.

killings were pretty straightforward, and a few were even handled off-screen, the sequence is noted for its ingenious on-screen murder of Las Vegas mobster Moe Greene. "For the first time in my life," stated Flowers, "a director came up to me and said: 'You have nearly all the time you want. You'll have all the money you need to spend. Let's kill somebody in a manner that's never been done before.' Now over the years in show business people have been killed in every way imaginable — knives and razors and guns and clubs. What we did was come up with the idea of shooting Moe Greene in the eye, through his glasses — which presented some problems. I had tried this before for TV, but due to the time element we never did get it properly — it was a tricky shot."

Caan examines Smith's handiwork as preparations are in progress for a subsequent scene in which Don Vito delivers his son's bullet-riddled corpse to a mortician.

In the scene, Greene is lying on a massage table. When the hitman enters, Greene raises his head, puts on his glasses and then is fired upon. The shot required two cuts utilizing two different pairs of glasses. Within the thick tortoise-shell frames of one were concealed two small tubes which fed back around actor Alex Rocco's head. By using compressed air to fire a tiny BB at high velocity out one of the tubes, the lens glass was blown outward by the force rather than in. "We used breakaway glass for the lens," said Flowers, "and when we cracked it, we also gave a shot of blood through the other tube. At the same time we continued blowing air so that no particles of glass would go into the actor's eye."

The response to *The Godfather* upon its release in early 1972 was unprecedented and unpredictable. In creating an epic saga of crime in America, Coppola allowed his actors and technicians a showcase for their best work — and they met the challenge. The instant-classic status and blockbuster boxoffice of the film — which won three major Academy Awards including best picture — convinced the producers that a sequel was a sure-fire property. Having forged strong relationships on the first production, Coppola sought to repeat that success by bringing back many of his key technicians for the follow-up — *The Godfather Part II*. "I wasn't all that keen about working on *Part II*," Dick Smith admitted, "but Francis was very enticing. He said, 'I've written this so we can go to the greatest locations — Lake Tahoe, New York City, the Dominican Republic, Trieste and, of course, Sicily — we're going to have a great time.' And he was right." A.D. Flowers and Joe Lombardi were also brought back — this time for the foreign locations as well.

What Coppola intended for his sequel was not a straightforward continuation of the first film's narrative. Instead, using two storylines, the film would trace both the early life of Vito Corleone as he ventured to America and initiated his crime dynasty and the more contemporary story involving his son Michael's desperate attempts to consolidate and hold onto the family's threatened empire. Because it proved to be a more contemplative character study, the violence in *Part II* was considerably lessened, though still rather graphic. The film's opening scenes show nine-year-old Vito Andolini witnessing the murder of his mother by the local Mafia chieftain, Don Ciccio, who had already ordered Vito's father and brother killed. A shotgun blast sends her reeling back with a force that looks as if actress Maria Carta had been helped along by a cable and harness — but that was not the case. "She did it herself," Lombardi recalled. "We just worked with her so that she knew exactly how to jerk herself out and back."

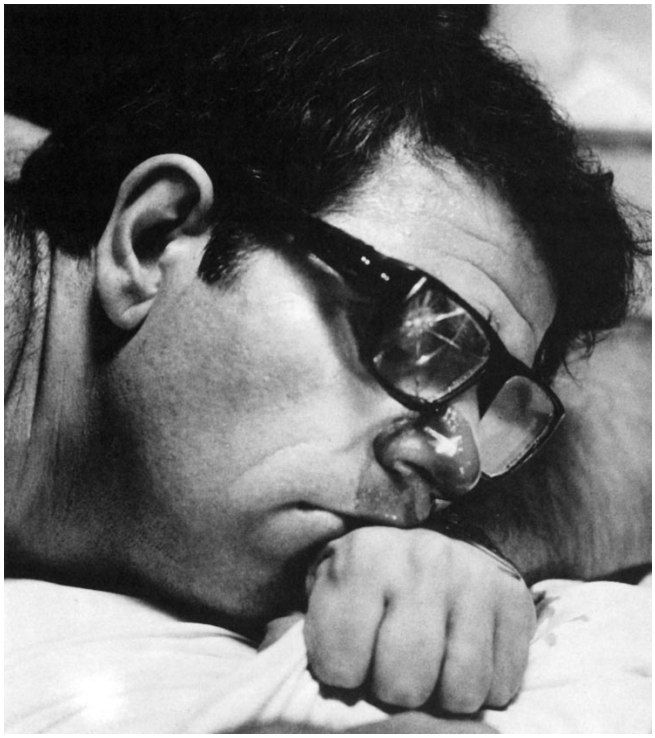
Smuggled out of the country, the boy arrives at Ellis Island where he is rechristened with the name of his hometown and grows up on New York's Lower East Side. The early New York episodes depict

the young adulthood of Vito Corleone (Robert De Niro) as he encounters the ruthless Don Fanucci (Gaston Moschin), a dapper figure whose strong-arm tactics cost Corleone his grocer's job, forcing him into petty thievery to support his family. In a scene cut from the final release, Corleone happens upon an assassination attempt on Fanucci. As three punks jump the man in an alley, one reaches around from behind and slashes his throat with a razor. Fanucci manages to push them off; and as they dart away, he performs the pathetic act of trying to catch the blood draining from his neck in his white hat as he runs down the alleyway and disappears.

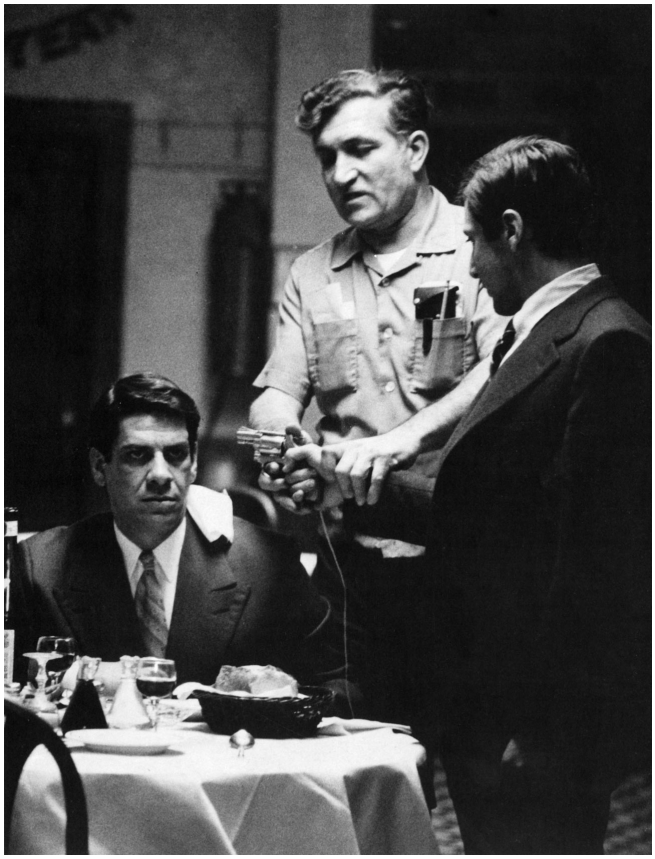
Other killings abound. When Corleone enforcer Luca Brasi is garroted in a bar, his assailants first drive a dagger through his hand to immobilize him. The blade — cut in half and welded onto a small plate — was affixed to the back of actor Lenny Montana's hand by Dick Smith and disguised with mortician's wax.

"Coppola wanted that all on one shot in a master," recalled Smith. "A.D. Flowers rigged it up with two canisters on the man's right side — under his arm where it'd be least likely to show under his white suit. One canister was compressed air and the other was filled with blood. Then he put a button in the palm of one hand that the actor could touch and that would set the thing going. On his neck we put a precut foam latex piece with little tubes underneath to pump the blood. It was stuck together just lightly with sticky syrup so that when the guy jerked his head back, he would make it split open. Then he could press the button in his hand and the blood would pump. "We shot this on a miserably cold fall day and there were not enough white hats and white suits. Coppola kept doing take after take, and we were going crazy running out there trying to mop off the blood and getting Gaston into a clean suit to make this effect work again and again. A hell of a day!" After all that, the scene did not even make the final cut — although it was reinserted for the 1977 home video incarnation, *The Godfather Saga*, in which Coppola reedited the first two films into chronological order and supplemented them with footage that had not appeared previously in either theatrical version.

Finally, the future *Godfather* commits his first murder. The scene, the most memorable of the film, is a grand example of how Coppola treated violence in a dramatic context. Corleone tracks Don Fanucci through the San Rocco street festival, then sneaks into his apartment building and lies in wait outside his door. Fanucci enters, fails to see his assailant hiding in the hallway, and is shot in the chest and face. After his victim collapses to the floor, Corleone sticks the barrel of his revolver in Fanucci's mouth and blows the back of his head off. "I had to make a plastic duplicate of the revolver and place a rubber shaft on it so De Niro wouldn't hurt him," said Smith. "You wouldn't want to take a regular metal gun and shove it in someone's mouth like you mean it. An actor could easily overact."



The execution of Moe Greene — shot through his glasses while lying on a massage table — was rigged by A.D. Flowers. Inside the glasses frames were two small tubes. Compressed air fired a tiny BB at the lens, blowing the shattered glass outward and away from the eye. Stage blood was pumped through the second tube.



In preparation for the execution of Don Sollozzo by Michael Corleone, Joe Lombardi instructs actor Al Pacino in the use of a specially rigged pistol. A wire running from the gun to a squib concealed on actor Al Lettieri insured synchronous firing of the charge when the trigger was pulled.

Fanucci's murder is the most graphic in the film. Others such as the shooting of Fredo aboard the fishing boat, the rebel bombing of a police car in Havana and the airport assassination of mobster Hyman Roth are depicted obliquely. The most difficult aspect of the effects on this production would be the staging of explosives, either in the machine gun attack on Michael's bedroom or the fireworks in the street festival.

In the bedroom attack, gunfire crashes through the windows and tears apart the walls and furniture as Michael hurls himself across the bed to protect his wife. Extensive dress rehearsals were necessary to walk Pacino through the scene, to insure that the timing of the effects man on the firing board, the actors and the camera operator were all in sync. "I don't think that any of those scenes were necessarily what you would call difficult," said Flowers. "As a matter of fact, the most simple shots sometimes get so simple that effects men goof on them because they think there's nothing to them. This kind of work should be well prepared and there should be plenty of time to rehearse. Effects men test a lot of this stuff on each other. When we're trying to work something out, we may try five, six, sometimes ten different methods. They may not work right, or they may not appeal to us; but once we have the effect worked out, we show it to the director. The more preparation time you have, the more simple the shot is; and on most of *The Godfather I* and *II* we had enough time to prepare what was wanted."

For the vengeful murder committed by Vito on Don Ciccio, the Sicilian Mafia figure who killed his family years earlier, Flowers constructed a false abdomen for the Italian actor playing Ciccio which Robert De Niro then had to slice open with a knife. "We had to take a body cast of the actor and from that we made a fiberglass protection plate for him. Then we covered it with foam rubber. With that false belly, he looked like he was pregnant. When De Niro cut into him, we just pumped the blood right out. But no guts — we didn't go *that* far." De Niro, the consummate actor, found the gory scene unnerving. "He was a nervous wreck," admitted Lombardi, "but he did it all, cut the guy's belly right out. What was worse was my trying, in broken Italian, to explain to this old guy what we were going to do to him. He wanted no part of it!"

Sometimes the effects work appeared so simple, and so realistic, that its effectiveness was taken for granted. In the Havana sequence filmed in Santo Domingo, Michael witnesses a political demonstration during which a rebel assassin jumps into a police car and sets off an explosion that kills both himself and a police official. "There were a lot of people around," said Flowers, "so the car had to really look like it was being blown up and still be safe. There are all kinds of methods, like using common flash powder. If we need to see debris flying, we use air pressure, say to blow a car door off, and we can add smoke as well. There's also bungee cord which we can use to make very elastic kickers to blow the doors off cars. One of the local people who was helping us asked me: 'How did you do that? I could make a lot of money doing that!' I said, 'You could hurt somebody.' And he said, 'Well, that doesn't matter, I could still make a lot of money doing that.' I didn't tell him *anything!*"

Fifteen years later, destiny — like the destiny which seems to call upon Michael Corleone — called upon Francis Coppola to complete the cycle as *The Godfather Part III* went into production in Rome. Shooting was to take place almost entirely in and around Cinecitta Studios and at Sicilian settings in Palermo and Taormina before moving to the United States for location work in New York City and New Jersey. Regrouping most of the original cast, Coppola also called upon many of his original craftspeople to bring the Corleone family saga to a close.

With an eye toward retirement since completing his Oscar-winning work on *Amadeus*, Dick Smith had lessened the number of film assignments he accepted, reducing his responsibilities to designing and supervising the concepts and applications of makeup. This he had agreed to do on *The Godfather Part III*, working with longtime associate *Robert* Laden who would accomplish the day-to-day applications and remain in Rome for the duration. "Before anyone went to Rome," recalled Smith, "all the key people were brought out to Coppola's place in Napa Valley for a big meeting. A lot of the old people from the earlier productions were there — Francis likes that — and he told us: 'Now on this film we have all the time we need. Everything's going to be just terrific. We're going to plan everything out and everything will go smoothly."'

Michael Corleone — inheritor of the family business — dives to the floor and pulls his wife to safety when the bedroom of their Lake Tahoe home is sprayed with machine gun fire in The Godfather Part II.

Outside the home, A.D. Flowers wires up a nail board triggering mechanism. Each squib affixed to the windows, or hidden within the room, was wired to a separate nail. When a striker connected to a battery was rubbed across the nail heads, electrical contact was established and the charges detonated sequentially.

Breaking down the script, Smith began designs for the appliances called for in the screenplay. One was needed for an early scene in which Vincent Mancini (Andy Garcia), heir apparant to the Corleone legacy, bites off the ear of Mafioso rival Joey Zasa. "Joe Mantegna, who played the part, came here and I cast his ear and made up a fake one that would bleed, with a tip that would come off and so forth." Smith suspected that the illusion would be too graphic — and he was right. In the final edit, the scene was toned down considerably. The blood is not dwelled upon, and the shock of the attack is offset by Michael Corleone's startled reaction as it plays out before his eyes.

Vincent's attack on Zasa denotes how *Godfather III* differs from its predecessors. Having been preceded by a decade and a half of extremely violent films in which virtually every form of atrocity had been dramatized, Coppola recognized that the power of screen violence had been weakened for

an audience inured to such spectacle. The violence in *Part III* therefore is short and to the point, not allowing for the contemplative horror of these actions as examined in the earlier films.

Set twenty years after the last installment, one of *Godfather III's* challenges was in aging the actors who were repeating their earlier roles. The sixteen years of real transpired time — for the most part — was not reflected in their faces and artificial aging proved to be a sensitive issue. "Diane Keaton was very opposed to being aged," said Smith. "She virtually refused. That was a problem for Coppola to deal with. I think he did it mostly with very careful shooting and angles so that it was suggested rather than literally done. She would never have gone for old age stipple or something like that — even the slightest amount. Talia Shire on the other hand was very cooperative in terms of makeup — although she got very upset when, without talking to her, Francis suddenly decided he wanted her to be fat. And in fact some appliances were made up for her by a studio in Hollywood. I put them on her in Rome for testing, and we were all happy, frankly, that they didn't work — they just weren't right for her. She has a very strong face, her hair is severe, and with a little old age stipple she looks very tough, like a wiry older Italian. That can be quite successful in and of itself."

But Smith's major chore was aging Al Pacino on whom he had applied old age stipple for the closing shots of *Godfather II*. "On a young person, stipple never really looks quite convincing because all it does is add texture. The aging called for in *Part III* was more drastic." Now in his sixties, suffering from diabetes and weighed heavily upon by the sins of his past, Michael is set upon redeeming himself and going legitimate — a difficult goal made all the more so by his vengeful business partners. As Smith had aged Brando with the idea of creating a suave but heavy figure burdened by a life of crime, so too did he seek to present Pacino in the light of a spirit seeking redemption. "Francis wanted him to look like a bulldog, with a face somewhat like Brando's *Godfather* face — heavy and worn. Al added his own requirements. He wanted to look like a man who had suffered and who was changing, but who was still a charismatic character, still attractive to women and so forth. So there was a whole list of things that were supposed to go into this makeup."

Smith prepared a few concept sketches which included subtle jowl appliances and a range of hairstyles. Coppola was pleased with the overall look. "My approach is always to use as little makeup as possible," Smith noted. "It's easier for the actor, it tends to look more natural and it takes less time to put on. And Pacino wasn't much more accepting of sitting in a makeup chair for hours every day than Brando was."

Conducting tests in the kitchen of Pacino's house — a half-hour drive from his own New York home — Smith tried out jowl appliances and varying densities of old age stipple. "Al is about fifty and very well preserved. His hairline is rather dense and a little on the low side; but there's no real thinning, so it isn't suitable for much age. He had long hair — I mean almost down to his shoulders — and *black!* Black hair is almost impossible to gray or whiten to any extent and not have it look phony. So I proposed not only giving him jowls, but also thinning out his hairline, graying it and cutting it shorter. Al loves long hair. We had more trouble with him on *Godfather I*, because though he was supposed to be straight out of the army he always wanted his hair long. We had to fight with him to trim it so it would match from shot to shot. So Al said: 'Wait till we get to Rome because I want Francis to make the decision. I don't want to do anything without Francis' approval.'"

Because Pacino would not do any hair testing before going to Rome, Smith told the production office that he would need two full weeks prior to shooting to finish the makeup — including a week to cut the hair, bleach it and perhaps persuade Pacino to recede his hairline — and then perform camera tests. Smith also needed time to train Bob Laden in applying the makeup. Having been promised the two weeks of preparation, Smith found his schedule slashed drastically by the time he arrived in Rome. He and Laden had a mere five days of preproduction in which to prepare and style Pacino's hair, test the makeup and hair, and then rehearse the application before shooting was to commence the following Monday. "On Thursday we saw our screen test. Everyone agreed that the appliances were good and Al's hair color was good, but Francis had still not decided about the hairstyle. Somewhere he got the idea of doing a crewcut! So on Thursday, Francis says: 'I'll think about it tonight and you'll have my decision tomorrow morning at nine o'clock.' I went back to the hotel and I was really worried. Knowing Francis as I do, I had a gut feeling he was going to strike for the oddball thing and go for the crewcut — and it worried me the more I thought about it. Gray streaks had been bleached into Al's hair, but this process requires that hair be at least two inches long. If you cut hair into a crewcut, as it grows out there are going to be dark roots coming in and it's very difficult trying to match it with hair whitener. More importantly, there was a danger that with the crewcut Al might look younger. So I went in the next morning all ready to argue my case. When Francis arrived at nine o'clock, he said, I gotta go talk to Al first,' and he disappeared into Al's dressing room. We were all standing around the hallway outside waiting and he was in there about forty-five minutes — which I presume was the amount of time it took him to talk Al into cutting his hair. Then he came out finally and he said: 'It's all decided. We'll use the appliances and a crewcut."

Smith tried to argue against the crewcut, but Coppola would not listen. "I was upset. We had a misunderstanding, shall we say; and when the dust settled, we cut Al's hair. Because of Al's resistance, it was kind of a long crewcut and on the first day of shooting it didn't look right; so they had to talk Al into cutting it even shorter, which was done and then it looked better."

Smith also looked to apply a new technique he had developed which allowed for the mere coloring of the appliances and adjacent skin without covering the entire face with a base. By using an approach akin to pointillistic painting, he would employ three colors closely approximating the actor's natural skin color — one slightly darker, one slightly lighter and one fairly transparent — which could be readily blended to disguise the appliance edges and make them disappear into the actor's face. Spotting the latex and the surrounding skin tended to create a more natural texture of color than a single tint applied evenly. "I developed the technique in an attempt to work out a more believable — and what I *thought* would be a more simple — method of coloring, though it can vary from subject to subject. The problem for Bob was that we were not allowed to work on either Saturday or Sunday; so when we started filming on Monday, he had never had a chance to practice. It takes a certain knack to apply the colors sparingly so they don't turn out like big splotches — it's difficult to achieve that in the first go-around. We were on location — which meant that Bob was unable to sit at dailies and see his results on the screen. So he had to go solely by my direction, which is the worst way to learn something. If he could have seen the makeup on film, he could have easily corrected it."

Compounding matters was Gordon Willis' pronouncement on Monday and Tuesday that the makeup was unfilmable. A message came from Coppola before the third day of shooting directing

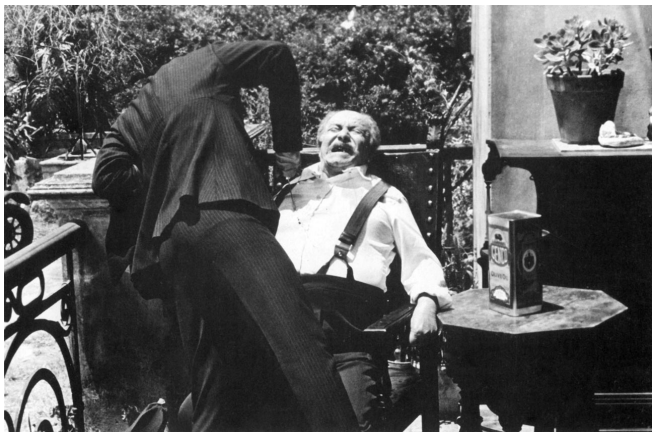
that the appliances be jettisoned and stipple tried instead. “I could not see for myself what the problem was,” said Smith. “I was unable to review dailies. Gordy can be very difficult in terms of makeup. So on Wednesday, reluctantly, I put on two coats of old age stipple and Gordy said he *still* couldn’t shoot it. Now it’s a crisis because they only have access to this municipal location for the week and they have to complete the scene. So I was told to just clean it all off and let Fabrizio Sforza — who was the chief Italian makeup artist — try *his* stipple because they really thought his was a different kind. Well, Fabrizio is a very good makeup artist — and certainly no dummy — and so he knew that the only thing that would satisfy Gordon was practically no makeup at all, the least amount possible. So he put on one layer of stipple. He did an excellent job and Gordy said he could shoot that. So that was the way the makeup was decided. Now it’s *okay*, there’s nothing wrong with it, but it is nothing like what everyone dreamed of doing. And I think it’s a great pity. If we had had the finishing time in Rome we were promised, I know we could have applied this makeup beautifully.

Two separate storylines run throughout the second film. Intercut with the contemporary history of Michael Corleone is a period account of his father's immigration to America and his rise to preeminence in the world of organized crime. As a young man, Vito Corleone — played by Robert De Niro — witnesses an attack upon the hated Don Fanucci by three street hoods. One of them slashes the throat of the Don, who nonetheless manages to throw off his assailants and escape.

"But the pressures on Coppola were just monumental. The argument that I had with Francis on this film I don't think would have taken place in an earlier day. I think he would have listened to me. He just didn't have the time or the patience or the energy to stop and listen. Yet to be perfectly honest, I don't think that any film is going to suffer for lack of a couple of jowls. It would be absurd to think that anyone's going to miss it. But like other touches, it would have been a nice one. So Bob and I came home. We both felt we had done our best and we were just as well out of it. It was a tough production to work on from all the reports; but I'm disappointed, because it would have been nice to see it done the way it was visualized."

Dick Smith examines a prosthetic neck piece fitted to actor Gaston Moschin. At the appropriate moment, Moschin could make the cut rip open and also activate a blood pump concealed under his arm.

A.D. Flowers had retired following *Apocalypse Now* — as had Sass Bedig — but he was consulted by Coppola to determine possible methods for executing the physical effects requirements of the film. "I spent two or three days with the production crew and wrote up in detail what I would do. Coppola had a year to program these, to work them out — that's what he does — but by the time they got to the script as filmed, practically everything had been rewritten. The effects weren't fully what I suggested but similar, along the same lines." Joe Lombardi was involved with another Paramount production, *Flight of the Intruder*, so his associates, Lawrence Cavanaugh and R. Bruce Steinheimer — both of whom had worked with Coppola before — headed up the effects team.



Vito travels to Sicily to exact revenge on the man responsible for murdering his parents and brother. A body cast was made of the actor and a false belly was constructed over a fiberglass protection plate. De Niro was then able to slice the man open — or seemingly so — with a knife.

Because of the length of the production — approximately six months of principal photography — most of the crew was local, which created minor problems for the American supervisors. "It's difficult to shoot in Italy because of the language," affirmed Steinheimer. "It seemed everything took twice as long to do, because if we had a problem it took a translator to describe the problem and then somebody to translate it back. But we were fortunate to work with a master effects person over there, Giovanni Corridori." Utilizing Corridori's shop and technicians, and bringing in from Hollywood Isadora Raponi to serve as an effects translator, Cavanaugh and Steinheimer worked with as many as a dozen assistants for the most involved sequences.

Upon leaving the production, Dick Smith had given his notes and designs for upcoming makeup effects to Fabrizio Sforza, but in some instances the responsibility for carrying out those effects was passed on to Cavanaugh and Steinheimer. "One major effect was in the sequence where two thugs

are sent to kill Vincent," said Steinheimer. "We took that over by default. Dick Smith had at that point resigned and Fabrizio hadn't really volunteered to do it, so it became our baby. In the scene, Andy Garcia had to shoot a guy in the head at close range, so basically we had to blow the guy's brains out into a mirror and tie that effect in with the mirror breaking and with the splattering of blood."

Tom Burman of the Burman Studios was contracted to make up a dummy head, which took three weeks to build and was then shipped off to Rome. The highly detailed prop, which duplicated even the actor's gold tooth, contained tubes to pass blood through the mouth and nostrils, and had a flap on the side that enabled the head to be used for multiple takes. An air mortar planted inside was filled with a large chunk of skull, blood and sponge and covered with latex rubber skin with hair attached. "With the puppet head," said Cavanaugh, "we were able to put full loads of blanks in the gun, so that instead of fire exhaust coming out of the end of the barrel, you would see it actually flashing out of the chamber. It made a really beautiful red flash effect." Both the mortar and the squibbed mirror were tied to a hard-wired electronic circuit that was triggered by the firing of Andy Garcia's revolver. "The first time we did it, the effect was a little too gory. So we did it a second time, changing it to where it was just straight blood being discharged from the dummy head. Then Andy turns around to face the other would-be assassin. He shoots him through the hand — we put a prosthetic latex piece over the actor's palm — and the bullet goes through his hand and then hits him in the neck. There was a wire going up Andy's sleeve running down underneath the carpeting, up to the guy's costume and then a secondary wire into his costume for the other squib. Like the head shot, the effect was timed off of Andy's gun, so the second that pistol flash discharged, everything went off. You can't miss that way. The timing is always perfect. Very few effects men do that — which is odd because there's no chance of a miscue from any slight hesitation or pause. The important thing is that the actor has to shoot the gun just as he would a real gun. He has to aim exactly where the shot is supposed to hit; because if he doesn't, the camera will read that — especially with over-the-shoulder shots."

Following the attempted hit on Vincent, Zasa — the man responsible — parlays a Mafia conference into a massacre as a luxury Atlantic City hotel suite becomes a target for a massive machine gun attack from a helicopter hovering outside the window. Filmed on stage at Cinecitta, the set contained more than three thousand squibs of varying types and sizes and about four miles of transmission wire. "I had to be in very close contact with the set designer and the construction people," said Cavanaugh, "to insure that almost everything on that set was made of lightweight materials that wouldn't splinter or throw hard debris. Anything that looked like masonry was made out of a chalky material that turns to dust when a squib goes off on it. The banisters and railings — which looked like they were marble — were really made of a very lightweight material. All wood items were made of balsa wood and wall surfaces were made out of a paper product. When the pyrotechnics go off, normally all of these things will just vaporize before making contact with anybody. To enhance the effect, we put a lot of dust in the hits — especially the masonry hits. We used cement, granite or colored dust to match. Sometimes we accented the hits with little ricochet sparks. Usually I don't do that too much — it's an effect that's overdone. *Everything* sparks now when you shoot at it — even *rubber* sparks in some movies!"

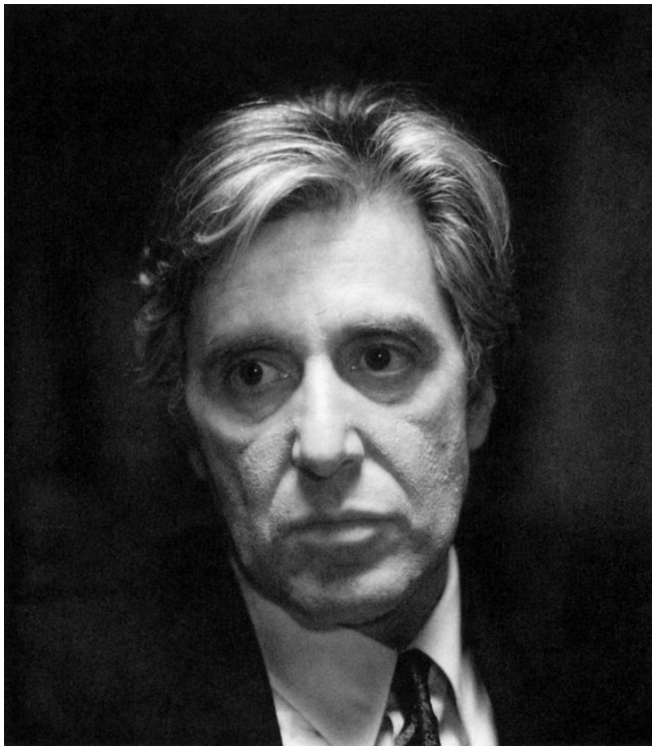
After resisting involvement in a third chapter of the Corleone saga for sixteen years, Francis Ford Coppola agreed at last to make The Godfather Part III, provided he was given total control. Headquartered at Cinecitta Studios in Rome, the production shot for six months with many of the cast and crew members who had worked on the earlier films.

As conceived, the chaotic sequence was to be shot entirely with stunt doubles. “At least twenty people were wired with multiple hits. When we started the sequence, however, Francis was upset that we weren’t going to be showing the actors. We had a big discussion and essentially told him we could do it if we positioned the actors in exactly the right places and took out some of the stronger explosives we were planning to use. So we did that. Al and Andy are right in the middle of all of those hits. There was stuff flying *everywhere*, but they didn’t get hurt.”

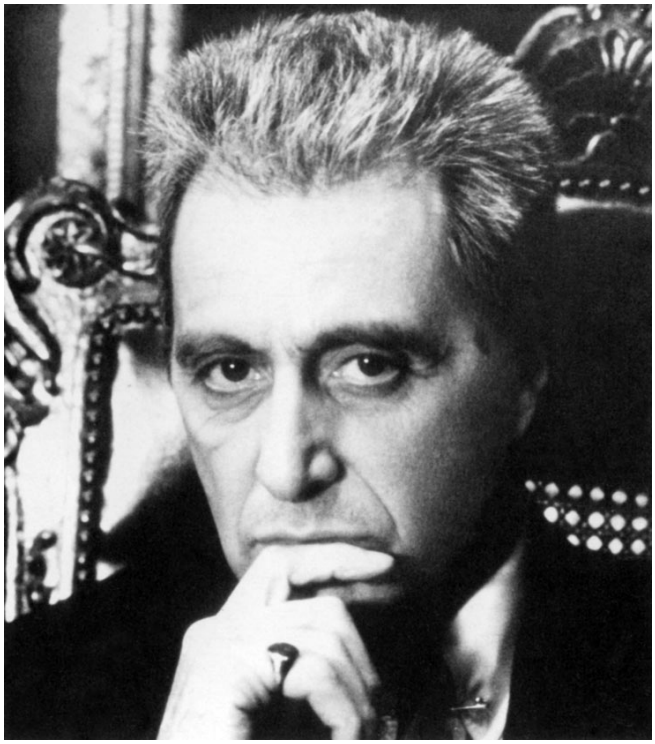
The action took about a week to capture, but did not include any footage establishing that the attack was coming from a helicopter — that was originally to have been inferred by the shaking of the room and the rumbling on the soundtrack. To avoid possible audience confusion, however, a helicopter shot — accomplished by *Industrial Light and Magic* — was added in post-production. The ILM optical department also enhanced the smoke and debris on one of the shots of Pacino ducking gunfire which Coppola felt looked too clean.

In retaliation, Vincent orchestrates the assassination of Joey Zasa during a street festival in Little Italy. Disguised as parading Knights of Columbus, hitmen throw open their cloaks to reveal shotguns which they use to dispatch Zasa’s bodyguards. In the process, they also level a nearby hot dog stand, showering Zasa in ketchup. As he runs for cover, Zasa is cornered at the locked entrance of a social club where he is confronted by Vincent disguised as a mounted policeman. Through the glass door of the club, the camera observes as Vincent fires two shots at his adversary. The bullets pass through the gangster and pierce the glass doors, and Zasa collapses to the ground.

“Originally Zasa was going to crash through the glass door,” said Steinheimer, “so we were going to have a stunt guy turn his head back towards Andy, and then have him get shot and come through a door made from tempered glass. Less than twenty-four hours before we were going to shoot it, Francis



Dick Smith was to have returned as makeup chief, charged principally with aging Al Pacino to play the physically failing Michael Corleone, now in his sixties. A test makeup performed on the actor included gray-streaked hair and subtle foam latex jowls. Aesthetic disagreements with Coppola over hairstyle and the ultimate abandonment of the appliance approach led to Smith’s resignation from the picture.



decided he wanted to see Joey's face through the door as he's hit. And he wanted to see the effect of the bullets going through Joey and through the glass. We had a half-day's notice to put this together." The effects team began by replacing the tempered glass door with laminate glass — the type used in auto windshields — which will crack, but not shatter. "On the camera side of the door we positioned two air cannons — called trunnion guns — which fired glass balls. Those were coordinated with Andy's gunfire and with the body hits on Joey. Both Larry and I were hoping for a little more blood effect. But in the whole film, Francis was backing away from blood — he didn't want to oversell the shot by making it too gory. I think it was an 'anti-horse's head' attitude." Nonetheless, during postproduction ILM was called upon to optically enhance the gore slightly by matting in blood being sprayed onto the glass.

Italian artist Fabrizio Sforza assumed the makeup mantle. The final aging of Pacino consisted only of dyed gray haircut into a crewcut — and a light application of old age stipple.

As the story moves to Sicily and the Vatican, where the swarm of Michael's business dealings threatens to bring down the Corleone fortunes — not to mention a Pope — the film climaxes at an elaborately staged opera featuring Michael's son Anthony. Intercut with the stage production is a montage of various murders, as well as the attempted assassination of Michael himself. None of the murders was deemed particularly difficult to execute by Cavanaugh, who noted that the most gruesome effect — a man killed by his own glasses plunged into his neck — was not even in the script originally, and was added only after principal photography had wrapped. What *was* in the script was the successful execution of Michael Corleone. It was a major surprise to Dick Smith when he saw the completed film and discovered that Michael had survived the attack on the opera house steps — losing his daughter instead — and that his ultimate demise was to come years later of heart failure.

The press reports that had been circulating since shooting began had already stigmatized the film as a 'troubled production,' and critics were quick to point out the film's flaws as if any *Godfather* picture were undeserving of them. *Godfather III* is a different *Godfather* than the first two. The impetus to wrap up plot points and characterizations drives the picture a little more speedily, so that the atmosphere created is more kinetic. But that is perhaps more a reflection of the times when comparing one film to another made nearly two decades before. What Coppola fulfilled ultimately in this third story of Michael Corleone was a portrait of a deeply tragic figure, purely American in ambition and European in temperament, who could not disassociate himself from a lifetime of violence, hatred, sadness and loss. "Francis was hip to the fact that this was not a *Die Hard," said* Steinheimer. "He was selling the merits of the movie on the acting and the directing, and not so much the effects — the effects were a complement. But that, in a way, makes the subtlety of what we were doing more difficult. And that's the beauty of Francis. When he walks through a scene, you have to be equally mercurious to adapt to what he thinks — and then you have to outguess him."

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